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NEOLITHIC MAN
IN
NORTH-EAST SURREY

W. JOHNSON & W. WRIGHT

1868

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Fig. 1.—*Round Barrow at Banstead.*

Stars silent rest o'er us,
Graves under us silent.

NEOLITHIC MAN
IN
NORTH-EAST SURREY

BY

WALTER JOHNSON

AND

WILLIAM WRIGHT

With a Chapter on Flint

BY

B. C. POLKINGHORNE, B.Sc., F.C.S.

WITH NUMEROUS ILLUSTRATIONS AND MAPS

BY

SYDNEY HARROWING AND FRANK PERCY SMITH

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PREFACE.

THESE chapters attempt to give the results of some years of observation and research respecting a familiar branch of archæology, so far as it concerns the North-East corner of the most beautiful of the home counties. The district explored lies close to the wilderness of London. In the exploration, difficulty has been the twin-brother of desire, for whilst it seemed well to examine the area nearest our feet, it was plain that this must be done speedily, for bricks and mortar are spreading apace.

The supposed barrow at Bedford Hill is demolished and built over; vandals have partly destroyed the barrows on Banstead Downs; and the crumbling fortifications at Cardinal's Cap, already barely discernible, are in private grounds, or they might soon be merged in the formation of a stronghold of more modern type. Beddington, Mitcham, Ewell, and other villages, are fast losing their rural features, Within the last two or three years the builder has spoiled some of the haunts of Neolithic man described in these pages. There were two further difficulties to be met. Much of the North Downs is covered with the compact turf of ages, which thus conceals ancient remains. On the other hand, in some localities the soil is so highly cultivated as to be practically inaccessible to the rambler.

The latter part of the book has some approach to uniqueness, and is, we trust, a real contribution to archæology. It deals largely with surface discoveries, which hitherto have been much neglected, if not despised. That there is sense in such investigations is admitted by no less an authority than Lord Avebury. He says, 'Stone implements are frequently found on the surface of the ground, or are dug up in agricultural or other operations. But those found singly in this manner have comparatively little scientific value: it is when they occur in considerable numbers, and especially when associated with other remains, that they serve to throw

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much light on the manners and customs of ancient times.' ('Pre-historic Times,' 6th ed., 1900, p. 95.) This paragraph might indeed serve as our motto. The general introduction to the story of Neolithic man is the epitome of much study on this fascinating subject. We believe that the statements are accurate. In order that the reader may verify and extend the information, full references are given, and, that the text may not be encumbered, these are collected in a separate chapter. It is believed that this list, with the occasional references throughout the book, will furnish a useful bibliography.

The area investigated is limited Northwards by the Thames; the Southern boundary runs from Box Hill to Oxted. The parallelogram thus enclosed measures roughly 14½ × 13 miles. Part of this area is occupied by London; as an offset, occasional allusions are made to places lying beyond the border. The maps and the drawings of implements have been prepared specially for this volume; the latter are taken entirely from our own collection. Our best thanks are gratefully accorded to Mr. Frank Percy Smith and Mr. Sydney Harrowing for their painstaking and effective labours in this department.

The section written by Mr. B. C. Polkinghorne should prove extremely useful. The subject treated therein has, we believe, never been adequately dealt with previously, even in standard works, and the amount of misconception and error which prevails is surprising.

Where we have ventured to leave demonstrable fact to offer suggestions, it is trusted that these are neither wild nor unreasonable. Ideas of this kind must, at any rate, serve as the basis of discussion.

Whether standing in a prehistoric excavation to eat lunch on a bitter, frosty day, or examining a barrow amid February sleet, or prospecting the Surrey corner field by field, or scraping off clay from the boots during a high gale, the scores of hours spent in North-East Surrey have been pleasantly spent. Whether they have been profitably spent, the reader will doubtless decide for himself.

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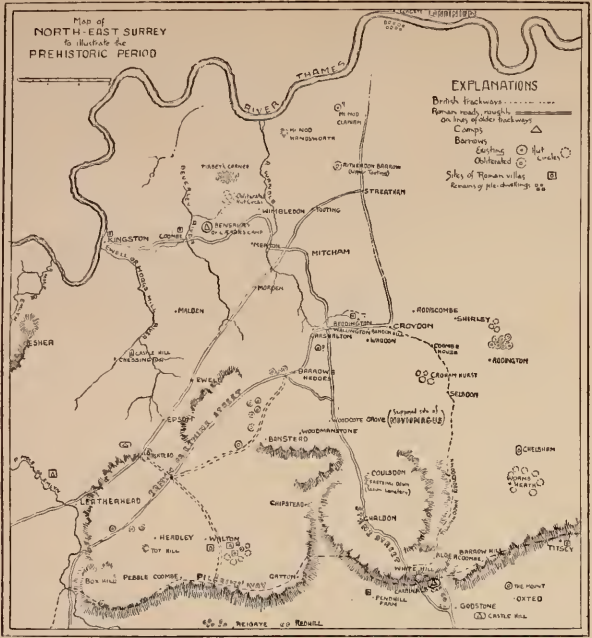
MAP OF NORTH-EAST SURREY



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CHAPTER I.

THE SEQUENCE OF RACES IN BRITAIN.

In order to render the following pages more interesting to the general reader, it may be well briefly to summarise our present knowledge concerning the succession of races in Great Britain. Such knowledge is based upon an examination of human relics of various ages, and upon social and ethnological data derived from a study of the peoples who still represent phases of culture corresponding to those of the various ancient races of this country. For the modern savage, as the late General Pitt-Rivers was wont to remark, presents us, if not with a photograph, at least with a portrait, of primeval man.

The most serviceable method of tracing the development of races is afforded by studying the nature of the tools and weapons of each stage. In general, races are believed to have passed normally from the employment of wooden weapons to those made of stone,[1]* thence to the use of metals, first of bronze, afterwards of iron. If, like Mr. H. G. Wells, we may indulge in reasonable 'Anticipations,' we may foresee a time when aluminium will partially supersede iron. In some countries, moreover, such as Egypt, Italy, Spain, Scandinavia and Ireland,[2] it has now become clear that there was a transition period between the Stone and the Bronze Ages, when implements and tools were made from copper unalloyed with tin. Nilsson and Thomsen laid

* See Appendix: List of References to Authorities Consulted.

down the aphorism that the Stone Age is that of savagery; the Bronze that of barbarism; and the Iron that of civilisation. Interpreting this liberally, one may accept the statements as helpful, but so far as Britain is concerned, the later Stone and the Bronze Ages by no means display lack of culture and intelligence.

The word 'Age' has just been used, both because it is convenient and because it is deeply rooted in the nomenclature of archæology. But it must never be overlooked that the various 'ages' merged into one another, that there was a consequent overlapping, and that, at a given moment, races have existed, and still exist, in practically every stage of development. The epochs of stone and metal are not found to be contemporaneous all the world over, yet they commonly follow in fixed order.[3] To borrow a word which Huxley applied to the geological strata, to describe the unchanging succession of members, in spite of local absences here and there, we may say that the ages, or rather stages, of wood, stone, and metal are homotaxial. And, just as there are, in most countries, omissions from the record of the rocks, so we find that, occasionally, races, by social contact with peoples in a higher stage, may take a short path and leap from the age of stone to that of iron. Also, it is plain that, at some time, there must have been one or more races who passed from stone to metal without influence from a more advanced society; this exaltation might arise from the discovery of native metal, either on the surface of the ground or in some river bed. Hence the comprehensive assertions of some writers as to the unfailing necessity of man's passing through all the stages must be received with caution.[4]

The wooden weapons which the earliest men are supposed to have used have, of course, long since decayed; we must therefore turn to the more lasting memorials of stone. The oldest British remains of this kind which are claimed as showing human handiwork are perhaps the flints found by Mr. W. J. Lewis Abbott in the Forest Bed of Norfolk,[5] a pre-glacial or Pliocene formation. These flints, if artifacts, would throw back the existence of man in Britain to the late Tertiary period of geological time. Many competent authorities, however, can detect no evidence of man's work on Mr. Abbott's specimens. Exciting more general controversy, are certain deep-brown flints found by Mr. Benjamin Harrison among the Kentish plateau gravels at and around Ightham, at elevations ranging from 400 to 700 feet above the sea-level. The greater number of these flints have been found on the surface of the soil, but others have been obtained from pits, at depths of 7 or 8 feet. The discussion as to the evidential value of the plateau flints has been waged round three points: Do the flints show signs of man's skill? Are they contemporaneous with the beds in which they are found? Are the beds themselves of Tertiary age? The second question seems to be answered satisfactorily. With respect to the first, the matter is complicated by the fact that among the specimens are several weapons exhibiting undoubted artificial signs, but belonging to a later stage—the Palæolithic, of man's history. Sir Joseph Prestwich accepted, and consistently defended, the genuineness of the 'workings.'[6] In fairness, it should be added that the marks are scarcely claimed as displaying what is known as flaking or chipping; they resemble more the somewhat regular batterings by which a very primitive people might trim a favourably-shaped flint to a rough edge or a hollow. Such bruises are stated, by Mr. Cunnington and others, to be due to ice-action and the natural collision of pebble against pebble whilst in motion, together with the wearing agencies of time. Sir John Evans also, no mean judge, can detect no artificial marks, and objects to the term 'Eolithic'—'dawn of the Stone Stage'—as applied to these flints. It is, perhaps, a fair summing-up of present opinions to say that the balance of belief seems to be in favour of the genuineness of the Eolithic flints. Whether they are of Tertiary age is another question. Sir Joseph Prestwich thought that the gravels might be of Pliocene age. He mentions discoveries in Surrey on the Western Plateau at Titsey Hill, near Limpsfield, 864 feet above the level; Botley Hill, 875 feet; and Tatsfield, 820 feet.[7] In none of these places were the numbers great. Recently, Mr. N. F. Robarts has recorded Eoliths found at Worms Heath, near Warlingham.[8]

Here we must leave the debatable subject of Eoliths until the geologist has uttered his last word. For an admirable epitome of the arguments for and against Tertiary man generally, the reader may consult Mr. E. T. Newton's address on the 'Evidence for the Existence of Man in the Tertiary Period.'[9] For practical purposes, a visit to Mr. B. Harrison's fine collection at Ightham will be better than pages of description. Mr. Harrison has also published a useful pamphlet, giving a list of authorities who have accepted the Eoliths as genuine.

When we come to the weapons of the Palæolithic, or Older Stone Age, we are on surer ground. The Palæolithic men entered Britain when its land-mass was still united to that of the Continent. Whence they came is uncertain, nor is it quite clear at what particular point of time they arrived here. But it is commonly agreed that their advent was during one of those mild intervals which alternated with the excessive severities of the Glacial period. Further than this we cannot go. Dr. James Geikie reckons six glacial epochs, with their corresponding interglacial periods, and he considers that it is not until the second interglacial epoch that we encounter abundant and unequivocal traces of man.[10] Sir Archibald Geikie, however, makes but two great glaciations,[11] and 'at least one interglacial period,' At any rate, we may conclude that, as the rigour abated, man followed the retreating ice northwards, and thus he came to settle in Britain.

Attempts have been made to express in years the time that has since elapsed, but all such calculations are more or less speculative, being based upon hypotheses and data which are themselves contested. Mr. Edward Clodd, apparently following the theories propounded by Dr. Croll and Sir Robert Ball, thinks that the glacial period began 240,000 years ago, and ended about 80,000 years since.[12] At the other extreme is the view held in his later days by Sir Joseph Prestwich, who narrowed the interval since the Ice Age to 25,000 years. He thought that Palæolithic man of the valley drifts appeared 20,000 to 30,000 years ago, and disappeared 10,000 to 12,000 years before our time.[13] One cannot help thinking that this low estimate was forced upon Prestwich by his acceptance of the Eolithic flints, with the consequent pushing back of man's advent to pre-glacial times. All that can be done here is to indicate that the antiquity of Palæolithic man—a short, low-browed being, probably allied to the modern Eskimo—is very great indeed,[14] and scarcely appreciable by ordinary methods of comparison.

Remembering that our object is to deal with Neolithic man, the description of the implements of his Palæolithic predecessor must be compressed into a small space, difficult as the task may be. The oldest implements belonging to this period are found in what is called river drift—that is, deposits of sand, clay and gravel, which were laid down when the present rivers pursued their courses in other beds, usually at a higher level. Frequently, the bones of the elephant, mammoth, and other Pleistocene animals are found scattered in the drift. Among the latest and most noticeable of the Surrey records were the bone discoveries at Mitcham and Thornton Heath in 1901, both places being hitherto regarded as rather deficient in bone remains.

Drift implements belong to a few generalized types, such as pear-shaped weapons for use as hand missiles, oval cutting tools, and knives and scrapers of varying shapes, manufactured from flint flakes. The first recorded weapon of the drift period was dug up in Gray's Inn Lane in 1690. Others were noticed at Hoxne, in Suffolk, in the year 1797, but it was not until Boucher de Perthes discovered numbers of implements in the Somme Valley, in 1841 and onwards, that their true nature was recognised. Until quite recently, it was taught that implements of the drift are not found North or West of an imaginary line drawn from about the mouth of the Severn to the Wash, it being supposed that, at the time of the deposition of the gravels, the region beyond was uninhabitable, owing to severe glacial conditions. Sir John Evans, indeed, with keen prescience, argued that renewed search might prove the existence of implements North-West of the assumed boundary. He submitted that, since the implements might be made of quartzite or older rocks, the workmanship would not be so easily detected; moreover, being difficult to make, they would be more highly treasured, and they would therefore be rarer.[15] We are now able to show the fulfilment of this prediction. A common friend, Mr. F. Davey, discovered many Palæolithic specimens in the drift of the Trent valley, not many miles from Nottingham, during the years 1900 to 1901. Some of these implements are of an uncommon facies, and the flint has a light, pearly colour, free from ochreous staining.

Without entering into the refinements of modern classification, it may be mentioned that the Drift implements are often assigned to different periods,[16] with which we need not here trouble the reader. Nearest, in age and character, to the Drift implements, are accounted those of the cave-men, and, in particular, those flints found by Mr. W. Pengelly, at Kent's Hole, Torquay. Here, sealed up for ages, amid remains of mammoth, woolly rhinoceros, great Irish elk or longhorn, cave bear and cave lion, were found flint tools, as well as a needle of bone, and awls and harpoons made from the antlers of reindeer. The cave-man is placed later than his companion of the drift, partly from his more extended range,—for caves are found in Yorkshire, and in North and South Wales, and partly from the more specialised character and finer finish of the implements. The cave-dweller showed great skill in engraving outline figures on bone and ivory.[17] The only example yet brought to light in England is the drawing of a horse on a fragment of rib, unearthed at Robin Hood's Cave, near Cresswell Crags, in Derbyshire. Human bones of undisputed Palæolithic age are in England few in number, though many imperfectly authenticated cases are recorded. Mr. E. T. Newton, after a most careful and painstaking review of the subject, considers that there are two instances of well-substantiated British discoveries of Palæolithic human remains. The first is that of the skeleton of a man found some ten years ago, beneath 8 feet of gravel, at Galley Hill, near Northfleet, Kent. The second is a fragment of a skull found in brick earth, filling a chalk pocket, at Westley, near Bury St. Edmunds.[18] A drawing of the fragment is given by Mr. Worthington G. Smith in his 'Man the Primeval Savage,' but unfortunately the fragile relic itself has been lost. Of the Palæolithic implements of Surrey we do not profess to treat, except to record a few of our remarkable surface finds, but specimens in their normal position in the gravel-pits of the Drift are fairly abundant. The valleys of the Thames and its tributaries are the principal hunting grounds. The gravels, brick-earths, and loams of Farnham, Worplesdon,[19] Mitcham, Carshalton,[20] Tooting Junction,[21] Wandsworth, Earlsfield, and East Sheen have yielded specimens to the collector.

Between the British cave-man and the man of the Neolithic, or Newer Stone Stage, many authorities now interpose a connecting Mesolithic or Middle period. They do not believe that the Palæolithic race was exterminated by a catastrophe, driven Southwards by stress of Arctic climate, or, as a body, attracted Northwards by retreating reindeer when less frigid conditions prevailed. The alterations in land-surface, in plant life and animal life, tell of unnumbered centuries separating the cave-man from the first undoubted inhabitant of the North Downs. The believers in continuity recognise this, but they do not consider that the gap is necessarily unbridged. Opinion, however, is sharply divided, the majority, standing for cleavage of race, apparently becoming less in the clash of discussion. Professor A. H. Keane thinks that when Neolithic man reached Western Europe he found the Palæolithic pioneers in possession.[22] Professor John Rhys, reasoning as a student of philology and folk-lore, concludes that the Neolithic invaders encountered an older race of people whom they enslaved or absorbed.[23] Mr. J. Allen Brown contends strongly for an unbroken descent, based upon complete development of the newer implements from the Cave and Drift types.[24] Observers in field and gravel-pit are often shut in to the same belief, partly because certain implements are of intermediate pattern,[25] and exhibit transitional chippings and re-working, and partly because implements are found in the uppermost layers of drift gravel, below the capping of mould or loam. The patina and general appearance of these flints do not agree exactly with those of either of the great divisions. On raised beaches at Larne and Kilroot, county Antrim, we have found worked flints which are usually called Neolithic. Mr. Alexander McHenry speaks of them as Palæolithic,[26] but their stain and pattern separate them on the one hand from English Palæoliths, and, on the other, from the Neoliths of Portrush and Ballintoy, in the same county. We are inclined to call these examples ‘ continuation flints ’ or Mesoliths. But the reader will gather that the question is quite unsettled. Dr. James Geikie, for instance, thinks that a marked hiatus separates Palæolithic from Neolithic man in North-West Europe,[27] although this could scarcely apply to Europe generally. With respect to South-Eastern England, the supposed hiatus is perhaps what De Mortillet calls ‘ *un vide par défaut d'observations*,’ not ‘ *une lacune effective*.’ We suspect that all the stages are represented in order from the Kentish plateau to the Thames bed, and that the chief difficulty is to correlate the Cave period with one of the river terraces. To come to the lowest terms : the ancestors of Neolithic man must have continued to exist somewhere, unless, indeed, we are to postulate a special creation of the new-comers. These visitors are represented by three bands of immigrants, who successively settled in Britain, and introduced respectively the Neolithic, Bronze, and Iron Stages.

SUMMARY OF IMPLEMENTS REFERRED TO IN THIS CHAPTER.

EARLY TOOLS AND WEAPONS.

I. Wood Stage.—All relics lost.
II. Stone Stage :
    (1) Eolithic.—Not universally accepted.
    (2) Palæolithic :
        (*a*) Drift type.
        (*b*) Cave type.
    (3) Mesolithic.—Not universally accepted.
    (4) Neolithic :
        (*a*) Chipped only.
        (*b*) Chipped, or chipped and polished.
III. Metal Stage :
    (1) Copper (in some countries only).
    (2) Bronze.
    (3) Iron.

CHAPTER II.

THE NEOLITHIC AND BRONZE-USING RACES OF BRITAIN.

WHETHER the dwarfish Palæolithic man survived the last fierce onset of glacial cold, and whether he subsequently became the slave of the Neolithic hordes, securing protection and compelling respect by his magic and wizardry,[1] are, as we have said, vexed problems. All we know for certain is, that after most of the ferocious animals of the Palæolithic period had disappeared, and their places had been taken, in part, by less harmful species, after the climate had become milder, and Great Britain had been finally sundered from the Continental area, another race of men crossed the Channel in their 'dug-out' boats. These people are spoken of as Iberians or Ivernians, and are supposed to have been akin to the Basques and Euskarians. Whence they came is unknown, nor can we ascertain the precise time of their arrival. As a working basis, the date may be approximately fixed as 5000 B.C., there being several clues which lead us to this rough time-mark. But, as in other prehistoric problems, there is not a unanimous consent. Professor Keane gives a far higher estimate of the antiquity of Neolithic man, and he claims that, viewed in the light of recent researches in Egypt and Babylon, his conclusions are confirmed.[2]

To the Iberians it is usual to apply the term Neolithic, since they were pre-eminently the fabricators of stone implements of the newer type. This race did not know the use of metals. Whilst observing this title, it must be borne in mind that the next arrivals, the Goidels, although acquainted with the use of bronze, continued to employ stone as well. Further, the third, or Brythonic group of immigrants, who inaugurated in Britain the Age of Iron, also retained, for special purposes, stone implements. The employment of stone did not wholly fall into disuse until Saxon or Norman times, and it is probable that we have a few distinct, though unimportant, survivals in this twentieth century. Incidentally, it may be noted that the Palæolithic men made implements chiefly of flints, and, for a few appliances, bone. In addition, the Neolithic men pressed into service basalt, diorite, quartzite, sandstone, and, as late excavations near Padstow prove, perhaps slate.[3] Discoveries of implements of jade, nephrite, and obsidian, in widely scattered localities, where these minerals are not native, give support to the theory that raw material and finished product alike were objects of barter. Another point of distinction is that the tools and weapons of the earlier period were probably always adapted for wielding by the hand, either as missiles, bludgeons, or ice-breakers, but the newer race had learned to place their flints in hafts and shafts.

The implements of the Neolithic Stage can be divided into an earlier and a later class. The typical common and connecting implement is the 'celt'—a convenient word, of uncertain origin, denoting an oblong or wedge-shaped tool, with a wide, curved, cutting edge at the broader end. In the earlier period, these celts were roughly chipped, as were the scrapers, knives, and rude chisels. These implements, with pounders, hammer-stones, and trimmed flakes, lie scattered on such hills as our North Downs, and by some writers, like Westropp, are deemed the true Mesoliths or 'continuation' specimens.[4] The later Neolithic group has its celts finely chipped, and ultimately ground and polished. Several of these have been dredged from the Thames at Battersea, Wandsworth, and Putney. Sir John Evans mentions two, from Croydon and Kingston respectively.[5] Others are catalogued in the excellent 'Victoria History of Surrey' (1902). The celt was a most comprehensive implement, and was probably used indifferently as hatchet, plane, chisel, wedge, or battle-axe. The great skill displayed in its balance and bevel, and the length of time necessary for bringing it to a high state of polish, rendered it a possession not lightly to be lost. At times, the actual stones on which the grinding was performed are discovered. The friction was usually backwards and forwards, as shown by the striæ, and the grinding-stone was relatively fixed. At Carnac, in Brittany, during 1901, we found one of the finer grained stones used for producing the polish. Associated with these triumphs of handicraft were finer sorts of scrapers, of diverse forms, called by French antiquaries *grattoirs;* arrow-heads, spear-heads, drills, and borers. The working of flints by pressure instead of delicate taps was now apparently practised.[6] Testimony as to the possibility of producing the secondary workings by means of pressure is supplied by the feats of Sir John Evans, who struck off flakes with a pebble, and imitated Neolithic work by trimming the edges with a stag's horn. He also succeeded in boring holes with a stick and some sand.[7]

We have next to chronicle discoveries of Neolithic implements of tiny dimensions, whimsically called 'midgets' or 'pigmies.' This class of tiny tools and instruments probably belongs to the latest Neolithic period, when bronze was used side by side with stone. Two pigmy flints were found, but apparently their real nature was not recognised, by Mr. Thomas Bateman when opening Derbyshire barrows.[8] Hundreds have been collected by the Rev. A. Gatty, first, at Bradfield, near Sheffield, at from 1,000 to 1,300 feet above sea-level, and secondly, at Hooton Roberts, in the Don valley, near Rotherham ; in each case the collecting grounds were ploughed fields.[9] In a far different position—namely, beneath 6 feet of peat—were entombed the specimens obtained by Dr. H. Colley March, on the Pennine moorlands of East Lancashire, at an altitude of 1,350 feet above sea-level.[10] Mr. W. J. Lewis Abbott found pigmies in a kitchen midden near Hastings,[11] and Mr. Polkinghorne has been similarly successful. We have discovered beautiful specimens near Scunthorpe, North Lincolnshire, and a friend picked up a stray flint of this kind at Bredon Hill, Worcestershire. One tiny awl-like instrument, facetiously called 'the winkle pin,' we dislodged from a Neolithic tufaceous deposit near Corfe Castle, where it was associated with the shells of limpets, oysters, and other molluscs. Our Surrey specimens are limited to one from Netley Heath, one from Richmond Park, two from Leith Hill, and another from Headley; these, with some probable ones recorded from Lockner Holt, near Chilworth,[12] appear to complete the county's record. Counterparts of the English 'midgets' are reported from such widely separated places as Egypt, South Africa, and the caves and rock shelters of the Vindhya Hills. The natural fascination of these minute instruments, and the discussion which, in the future, is likely to be centred around the unsolved problem of their use, form a sufficient plea for adding a few more words to what may, perchance, seem a disproportionate attention directed to these little gems. The notion that these flints were fabricated and used by a race of diminutive men may be at once dismissed. Some of the instruments, or tools, are obviously scrapers, awls, drills, and arrow-tips. But what are we to say of delicately shaped appliances less than half an inch in length, so thin as to be almost transparent, yet betraying such painstaking workmanship and 'retouches' that the tiny facets and edge-flutings can scarcely be seen, except with a lens? The refinement of touch, and the keenness of eyesight cultivated by the Neolithic artisan must have been of the highest kind. When we examine some of our own finds, and when we think of the arrow-heads, seven lines long and four lines wide, which Joly says were found in the caves of

Elba,[13] we are compelled to believe that, in any case, such 'pigmies' were not meant for practical use. Some may have been charms or amulets, and the specimens from the Derbyshire barrows seem to point to some superstition manifesting itself in a funeral rite. Unfortunately, barrow-diggers do not appear to have looked for pigmies hitherto. Other pigmies, again, were perhaps trinkets or toys; others, exemplars to teach the Neolithic boy what could be attained by practice. Doubtless, too, others were mere feats of skill, produced precisely from the same love of achievement which prompts a modern Sheffield cutler to manufacture a perfect pair of scissors which scale only a gramme or two, or a Flemish artist to depict a microscopic landscape on a grain of ordinary white corn. It may be granted that some of the midget implements had real uses unknown to us. The primitive dentist would require a very small lancet to cut the gum before extracting a tooth, the priest might use a thin, short knife to cut the veins of victims for ceremonial observances, and the earliest farriers would soon learn that bleeding could be practised best by neatly-made instruments. Tattooing also was responsible for some of the piercing instruments. In some districts, like one or two of those alluded to, regular factories were clearly kept up for yielding a supply of pigmies, but Mr. Gatty's 'finds' were interspersed with ordinary Neolithic tools, the larger kinds, particularly axe-heads, excepted.

From the preceding remarks, it might be gathered that fine workmanship is a decisive test of the lateness of the period to which we assign an implement. This is not entirely the case. Some of the earlier Neoliths are much rougher and cruder than the exquisite Palæoliths of Farnham, Dunstable, and Mildenhall, and till the end of the Stone Stage coarse celts appear to have been blocked out for heavy kinds of work. The main criterion as to whether a tool belongs to the Neolithic period is the position of its discovery. Whilst Palæoliths are found at various depths in drift gravels, brick earths, and deposits of cave floors, the implements of the newer age are found either on the surface, as on the sites of camps, villages, or factories, or hidden in barrows, kitchen-middens, sand dunes, raised beaches, refuse heaps, and collapsed hut circles. When dug up in caves, they occur in the upper layers only ; in peat beds they may be buried many feet deep. It may be, however, that our somewhat arbitrary classification of Palæoliths and Neoliths is destined to disappear, and, with Professor A. C. Haddon, we eagerly look for the discovery and correlation of the various deposits which may render this possible.

It is now time to say something about the Neolithic Iberians themselves. From a survey of their skeletons, found in barrows in the South of England, Dr. John Thurnam concluded that the Iberians were a short, dark-haired, dark-eyed people, with high foreheads and delicate features, betokening a considerable mental capacity. Their stature, deduced from a large number of measurements, averaged, for the men, 5 feet 6 inches, that of the women being slightly less.[14] The Iberians, it is believed, were akin to the Basques, who were masters of Spain and Portugal before the Christian era ; the modern Bretons, too, show racial affinities with these old invaders. Though their blood has been intermingled with that of many other peoples, the Iberians, as a race, have been strikingly persistent, and some observers consider that, after a long quiescence, this element is reasserting itself. The Neolithic folk are known as a dolichocephalic, or long-headed race—that is to say, they had skulls of which the ratio of breadth to length did not exceed 4 : 5. When this 'index' rises above 4 : 5, or 80 parts in 100, we get brachycephalic or broad skulls, which were characteristic of the immigrants who followed the Iberians to these shores. These were the Goidels or Gaels, a Celtic race belonging to the great Aryan or Indo-European stock. At once we hasten to explain that the terms 'Aryan' and 'Celtic race' are used conventionally, and for the sake of being intelligible. Each term embodies a theory which is hotly debated, but each is fixed in the nomenclature of ethnology, and so will be readily understood. The word 'Celtic' is here used to cover two groups of peoples: first, the Gaels; secondly, the Brythons who came after the Gaels. These peoples had racial and linguistic affinities. As a fact, the Goidels, who entered Britain somewhere between the eighth and the tenth century B.C., and the Brythons, who came from Belgica about the third century B.C., spoke dialects differing from each other as much as Latin differed from Greek or English from German.[15] With respect to the term 'Aryan' and its correlative 'non-Aryan,' the excuse for perpetuation is necessity—tyrant custom has already settled the matter. The late Professor Max Müller, reasoning on the basis of comparative philology, traced back the Celts, Teutons, Greeks, Romans, and other races to a primitive undivided stock which had its origin in Central Asia. He lived long enough to see his old theory discarded, but it must be confessed that the ethnologist and the philologist have not even yet settled their quarrel, nor determined the locality of the Aryan cradle. Meanwhile, the word 'Aryan' must stand for race-aggregates having obvious relationships in speech and blood. Let it be said, however, that it is scarcely to language that one looks for an answer to ethnological questions. Languages may be copied through friendly intercourse, or the compulsion of commerce; they may be enforced by conquest, or they may die out, no one quite knows why, by the fusion of races. Did we inspect speech only we might call the English a Teutonic, and the French a Latin people, yet how short of the truth would be such conclusions. Professor John Rhys puts the matter in such a telling style that we quote his fine passage:

'Skulls are harder than consonants, and races lurk behind when the languages slink away. The lineal descendants of the Neolithic aborigines are ever among us, possibly even those of a still older race. On the other hand, we can imagine the Kynesian impatiently hearing out the last echoes of Palæolithic speech ; we can guess dimly how the Goidel gradually silenced the Kynesian ; we can detect the former coming slowly round to the keynote of the Brython ; and, lastly, we know how the Englishman is engaged, linguistically speaking, in drowning the voice of both in our own day.'[16] (Kynesian is the name applied by Herodotus to the Iberians or Ivernians.) Plainly, judged by philological methods, the Palæolithic race cannot be discerned, and the advocates of a dividing chasm between the two Stone periods are so far confirmed in their view. Ethnology has a different voice, and Dr. John Beddoe, arguing from special characteristics, virtually supports the continuity theory. Having referred to the hypothesis that the Palæolithic people were the ancestors of the modern Eskimos, or that, at least, the Eskimos are the nearest blood-allies now living, he adds : 'Now I think some reason can be shown for suspecting the evidence of traces of some Mongoloid race in the modern population of Wales and the West of England.'[17] Among these traces he cites the oblique or Chinese eye, with almond-shaped opening and thick upper eyelid. There is also the feature of prognathism, or protrusion of the jaws—that is, as Dr. Beddoe puts it, many of the Mongoloids have very prominent mouths.

The Goidelic or Gaelic tribes subdued and drove back the Iberians towards the North and West of the island. Here and there, indeed, groups of Iberians would remain behind, either as slaves or partners ; others, again, might flee to rocky fastnesses or bleak moorlands whence it was neither easy nor profitable to attempt to dislodge them. After a lapse of five or six centuries, there arrived, from Belgica, the Brythons, or, as they called themselves, Brittones, the 'clothed' or 'cloth-clad' people, in contrast with aboriginal skin-wearing tribes previously encountered by them on the Continent.[18] The Brythons may be regarded as off-shoots from the Gauls of France, who came hither as settlers.[19] They dispossessed and edged back the Goidels towards the West, just as aforetime the Goidels had beaten back the Neolithic race. Hence we find the Gaelic tongue remaining as a dialect in parts of Ireland and Scotland and in the Isle of Man.

A strange event now happened. The Goidels, driven by pressure from the East into the arms of the Iberian native, made common cause with him against the Brythonic enemies, and eventually, perhaps, assimilated with him. Then the Iberian speech, having become loaded with Goidelic words, broke down, and ultimately disappeared as a distinct language. So far the matter is simple, but complication arises from the fact that particular groups of Goidels adopted the Brythonic speech ; as a consequence, modern Welsh, though Brythonic, like the Breton dialect, would appear to be the adopted language of a people who were really Goidels. There is more confusion to follow ; the disturbing influence of the Iberians broke up the Goidelic syntax, rendering it no longer Aryan. Goidelic idioms, in their turn, crept into the insular Brythonic talk, and the syntax of the latter is likewise non-Aryan.[20] We thus see, once more, that although, as Professor Rhys says, the soundest division of the Celts rests on phonology, yet language as a race-test is misleading and unsafe.

Modern research shows—and the fact cannot be too often reiterated—that, in spite of Roman, Saxon, Danish, and Norman invasions, we still have amongst us a large leavening of Celtic and even Iberian blood. Physically considered, the Celtic races were very different from the folk whom they disinherited. They were a tall, round-headed people, averaging, according to Dr. Thurnam's measurements, 5 feet 9 inches in height.[21] Their stature impressed the Romans, who do not seem to have had much intercourse at first with the shorter Neolithic race, except in the relation of masters and serfs. Large-limebd, fair or red-haired, and blue-eyed, with well-formed foreheads and prominent cheek-bones, these Celts were, if Dr. Thurnam's assessments are correct, a longer-lived race than the Iberians. The computation allows an average of 55 years to the former people, and 45 years to the latter, an exaggerated estimate, surely.[22]

The Iberians brought with them domesticated animals and plants, with a rude knowledge of the arts of spinning and weaving. The Goidels introduced, besides bronze, with its far-reaching influences, a skill in manufacturing coarse glass and pottery. Goidelic pipkins, Professor Boyd Dawkins thinks, often contained a less innocent beverage than water—at any rate, the word 'whisky' is of Gaelic origin. Tools and weapons of iron came with the Brythons. Soon the implements of the lithic and semi-lithic stages were in competition with well-designed and well-executed daggers, swords, chisels, axes, and bill-hooks of iron. But throughout the Bronze Age stone implements of certain kinds held their own, and perforated axes and hammers of stone appear to have come into use then for the first time. Even the iron axe would scarcely supplant the polished celt ceremonially, nor the iron spear oust the stone club from the churl's dwelling.

The Brythons, the 'ancient Britons' of the old text-books, traded with foreigners in tin and gold. Somewhere between 200 B.C. and 150 B.C. British gold pieces began to be coined,[23] the earliest specimens having been probably struck in Kent. By the time such results were accomplished written history began its reign. Pytheas, a mathematician of Marseilles, visited the South-East of Britain about the year 330 B.C. Two centuries afterwards, Belerion, a Greek, explored the tin district of Cornwall, and, finally, we get the Roman descent on Britain, the account of which appears in Cæsar's well-known 'Commentaries.'

Some of the information contained in the writings of these authors is very instructive, but the clues gained therefrom must be followed backwards. The Hallstadt implements of iron were copied from their bronze predecessors.[24] Bronze celts had occasionally iron facings on the edge, and iron swords long continued to have bronze handles. Similarly, the socketed axe of bronze has a well-mapped pedigree reaching back to the Neolithic celt. It is essential, too, to remember that the Neolithic stage lasted, though with ever diminishing vigour, into the Goidelic period, and perhaps later. On this principle our descriptions are based.

Of bronze implements Surrey has a good list. A socketed celt, 2¼ inches long, was found in Coombe Wood, Kingston,[25] completing the full genealogy of stone, bronze, and iron for that locality. Two winged celts or palstaves of bronze from Mitcham Common are exhibited in Clapham Public Library. In January, 1901, our friend Mr. I. J. Coleman, of the Battersea Field Club, obtained a fine spear-head of bronze from the superficial deposits above the Pleistocene sands and gravels in the Wandle valley, near Croydon. This spear-head, the longest hitherto noted, was exhibited before the Society of Antiquaries in May, 1901, and is now in the possession of Canon W. Greenwell. The length is 31½ inches, but, as a portion has been lost from the pointed end, the complete weapon was, Mr. Coleman estimates, about 33 inches long.[26] Bronze hoards—that is, stores of implements, moulds, and masses of metal—hidden underground, have been found at Croydon, Beddington, Kingston, etc. A good list is given in the 'Victoria History of Surrey.'[27] The line of descent in such places as Mitcham seems perfect. The words applied by Professor T. M'Kenny Hughes concerning the supposed gulf between the Palæolithic and Neolithic periods apply with great force throughout: 'There is no proof of any gap or break or cataclysm, but only of continuous changes.'

SUMMARY OF BRITISH RACES.

PREHISTORIC STAGE (STONE TO BRONZE).

- (?) I. *Eolithic.* — Race possessing some simian characteristics.
- II. *Palæolithic :*
  - (1) Man of the Drift period.
  - (2) Cave-man (perhaps now represented by the Eskimo).
- (?) III. *Mesolithic.*—Descendants of Drift and Cave men, still existing at the time of the Neolithic invasion.
- IV. *Neolithic*, *Bronze*, and *Iron* (overlapping periods).
  - (1) *Non-Aryan.—Iberian* (Neolithic race, allied to the Basques).

HISTORIC STAGE (BRONZE TO IRON).

  - (2) *Aryan :*
    - (*a*) *Goidelic Celts*, or Gaels.—Brought in bronze.
    - (*b*) *Brythonic Celts.*—Brought in Iron.
- V. *Romans*, *Teutons*, *Danes*, *Normans*, *Flemings*, *French refugees*, etc.

CHAPTER III.

NEOLITHIC ENGLAND AND NEOLITHIC SURREY.

THE physical geography of Neolithic England was in sharp contrast with that of the Palæolithic period, but bore a very close resemblance to that of the country as we know it to-day. Britain was now sundered from the rest of Europe. The severities of the Glacial epoch were gone, to return no more—that is, as we popularly reckon time. Yet there were considerable differences in the contour, climate, and occupants, which we proceed to indicate. If we would revert, in imagination, to Neolithic England, we must first extend the existing coast outwards to about the ten-fathom line, to undo the effects of the submergence which has since been going on. The Wash, part of the Thames estuary, and the Bristol Channel must become dry land. We must see thickets of scrubby oak, hazel, birch, and willow, thriving miles away from the modern coasts of Holderness, Lincoln, and Carmarthen ; we must uplift the sunken peat-bed off Walton-on-the-Naze, and unite the Isles of Wight and Anglesey to the mainland. The miry swamps and glittering meres of Somerset are to reappear, the wide woodlands of Wyre, Anderida, Arden, and Sherwood are to be real forests, untouched, save for a casual clearing here and there on the fringes. The present artificial drainage system, whether of the surface, as the result of scientific agriculture, or the deeper, vaster network of dykes and canals, the product of growing commerce, must be thought away, so as to leave virgin forest and marsh-flat, formidable barriers to the wayfarer.

Turning to Surrey, we shall find that the physiographical and zoological features have been influenced largely by those of geology. Starting at the Northern boundary, we have first the Thames, lazy and ill-defined, for the embankments, stretching from Richmond to the Nore, were not then formed.[1] The river crawled sluggishly in a more extended bed, and, especially at spring tides, constantly overflowed, depositing banks of silt here, and yonder making a lagoon. The sites now occupied by such towns as Bermondsey, Rotherhithe, Battersea, and Staines would be alternately mere and eyot. The gravel patches of Richmond Park, Coombe, Wimbledon, Wandsworth Common, Clapham Common, and the gravel-capped clay hill of Upper Norwood, stood high and dry above the general desolation. Centuries later than the date of which we are speaking, marauders crept round the creeks of the lower reaches of the Thames, and finding little alluvium and much gravel on the low hillock of the City and the higher plains in the vicinity, landed there and formed a settlement. But even so early as the Neolithic Age, Ludgate Hill and Mount Nod, at Wandsworth, may have had religious associations. Forest Hill, Denmark Hill, Sydenham, and Selhurst were doubtless covered with native oaks and beeches, it may possibly be with limes also.[2] Coombe Hill and Richmond retain but a vestige of their former shaggy woods. Where now stands the Crystal Palace there roamed creatures, if not so huge and terrible as those shown in Mr. Waterhouse Hawkins's restorations in the Palace grounds, still sufficiently vicious to be shunned by the Neolithic man who had come out unarmed.

South of the Thames alluvium we have a belt of some eight or nine miles of London Clay and Lower London Tertiaries, stretching across the county from East to West. Wherever these Tertiaries were of a sandy or gravelly nature, the Neolithic men had seized upon them as settlements; the clay bands were not much favoured until Brythonic times. Next in order we get the Chalk Downs with flattish ridges, and hummocks curving downwards hither and thither, to form coombes and 'bottoms,' but, as a whole, making an escarpment, facing Southwards, like an immense rampart. As on the clays and gravels, so on the flanks of these Downs, and in scattered spots on the summit, we still see patches of woodland, particularly where the disintegration of the chalk has left some depth of surface mould, as at Farleigh and Sanderstead. These copses aid the imagination in reafforesting the Surrey hills and in reproducing the earliest settlements of the Neolithic Iberians.

Bands of Upper Greensand and Gault follow the chalk in downward succession. Neither of these formations makes much geographical feature. Nor did this belt greatly concern Neolithic man. Very early in the civilised period the 'firestone' of the Upper Greensand may have been quarried; the present mines, for such they are, were begun in 1627 A.D. The churches of the downland and the North Weald are largely built of this perishable rock. Neolithic herds may have strayed over the Gault meadows, as herds have done ever since, but the modern application of 'blue slipper' clay to brick-making was certainly unknown. After the Gault is crossed, we descend along the upturned edges of the higher beds of the Lower Greensand, but soon rise again, for some durable layers of this formation have resisted erosion, and stand boldly out as a range of tolerable height. Surrey's greatest elevation, Leith Hill, indeed, is built up of Lower Greensand; it reaches nearly 1,000 feet. From the Lower Greensand ridge, and from some good vantage points of the Downs, the eye scans a diversified zone of plain and upland known geologically as the Wealden area. Here was the great primeval forest of Anderida, or Andredsweald, the 'Wood without houses,'[3] a huge jungle which long defied the approach of man, which, in Cæsar's time, formed an effective barrier against the

Roman legions, and which, in the Saxon period, became a safe refuge for the desperate and lawless. Settlement of any kind would scarcely be made in this district until the Teutonic invasion. It is said that there are neither Celtic remains nor towns of very great antiquity within the confines of Anderida.[4] Ages after, communication between the settlers and the outer world was practically barred by the wretched state of the roads. Cobbett, who knew the highways of his country better than most people, once wrote of this district : ‘ It took me a good hour and a half to get along these three miles. Now mind, this is the real Weald, where the clay is bottomless.’ Round the Eastern edge of Anderida it seems probable that Iberian, Gael. Brython, and Roman, successively stole in their wary advance to the Thames valley. Each would then leave the forest on the left hand, and pass along the route known to us as the Pilgrims’ Way.

The marshy nature of the Wealden Clay country recalls the fact that Neolithic England and Neolithic Surrey had a very damp climate. Dealing shortly with a wide and difficult subject, it may be generally stated that large forest areas produce wetness in two ways. The sponge-like action of the myriad rootlets prevents the return of moisture into the general circulation, whilst the boles and fallen trees interfere with the natural drainage by runnel and streamlet. These effects would be accentuated in impervious, retentive soils like the Weald Clay. Again, the excessive transpiration from the leaves would produce a humid atmosphere. Laid out, side by side, the leaves of a big tree would cover several acres, and a single large oak has been known to give off from 10 to 12 gallons of water in a day.[5] It is easy to see that, hanging over the Weald, there would constantly be a moist layer of air which would tend to cool and condense an approaching cloud, and the result would be further drenching of the district. On the other hand, trees conduct heat slowly, so that the times of the daily maximum and minimum temperatures of growing timber occur some hours later than the corresponding phases in the air. The consequence is a slight check against daily extremes of heat and cold.[6] Against this factor there is a set-off in the greater area of land in Neolithic England, which, Professor Boyd Dawkins and Dr. Windle submit, would give a more continental range of temperature, with greater *annual* extremes of heat and cold.[7] The comparatively slight difference in area suggests that the effects would be proportionately moderate, and that it would be easy to exaggerate this factor. Moreover, there has been another agent at work in mitigating our climate. A drained England has, admittedly, a somewhat higher temperature than had a foggy, clouded, undrained England. The records of palæontology prove the presence of the reindeer and elk South of the Thames during the Neolithic stage, hence the climate of that period was presumably a kind of mean between the severities of the Palæolithic epoch and the mildness of our own times. As to actual observation, we have the word of Pytheas, that in the fourth century B.C. the Britons threshed their sheaves of corn in barns, not on open threshing-floors as in the sunny South. Yet this very dampness must have been favourable to the pastoral side of Neolithic pursuits. How the climate affected the sites selected for settlement will be discussed later.

We will next take a peep at the fauna which existed in Surrey during the Newer Stone Stage. A swarthy Neolithic settler stands on a shoulder of the chalk bluff which commands the vale where now are built the villages of Tandridge, Oxted, Godstone, and Bletchingley. East and West are the billowy curves of the North Downs, and above the villages mentioned are the indents and cross-valleys of the Neocomian rocks. Far over the Weald, seaward, are the faint outlines of the South Downs.

Did our Iberian possess the imaginative powers of a present-day Briton, he might picture to himself the daily life of his Palæolithic forerunner, and pass in review the animals of the earlier stage, noticing the fate of the missing ones, and telling the tale of the lingering members. He would find that some creatures, like the mammoth and woolly rhinoceros, had become extinct ; others, like the musk-ox, marmot, glutton, lemming, and tailless hare, had retreated, either Northwards, or to the loftier mountains of Central Europe ; others, again, such as the lion, hippopotamus. and spotted hyena, had sought tropical climes.[8] But there were some persistent types, for the wild boar, the great wild ox, and the Irish 'elk,' or so-called 'longhorn' (*Cervus megaceros*, or *Megaceros hibernicus*), still remained. As our squat tribesman catalogues the animals known to himself, he is really detailing, were not his thoughts limited to the present only, a fauna destined to endure, in one country or another, until the time when these lines are written. The longhorn is the solitary exception ; it has everywhere died out.

On the marly sides of the hill selected for viewing the landscape and its concealments, badgers make their burrows ; in the woods of Titsey and Tandridge the wolf, marten, fox, and wild cat furnish perilous practice for the barbed or 'winger' arrow-heads of the settler. The chain of lakelets near Godstone and Oxted bear unmistakable signs of beavers' work in the form of dams ; there, too, the otter makes havoc among the trout. Centuries and centuries afterwards, these Oxted lakes, reduced through drier conditions to mere ponds, will still supply fish to the dwellers in St. James's Priory, Tandridge. Generations after this the antiquary will look in vain for traces of the building reared in the time of Cœur de Lion ; not a wrack will be left behind.

The slopes of Tilburstow Hill, on the opposing side, support thickets, whither the stag, roe, and hare flee, should they escape the skilful aim of the hunter. In the impenetrable forest of Anderida the bear roams undisturbed, and the wild boar wallows in the slimy margins of the pools.[9] The great urus (*Bos primigenius*), so common in the days of the Cave men, is not quite so frequently met with as of old ; as a compensation, the small, dark-coloured Celtic shorthorn (*Bos longifrons*) is well known to our Iberian, who is emphatically an animal-tamer, though he has not lost the skill and precision of his hunting forefathers. In his compound near White Hill, Caterham, will be found the sheep, goat, and hog, guarded by gaunt, semi-domesticated dogs. The shy and irreclaimable members have been driven away. The horse, a descendant, it may be, of the wild Palæolithic droves formerly so abundant, is apparently only just undergoing the breaking-in process, and so will be usually riderless. At any rate, he is not despised for eating purposes.[10]

Looking backward, some writers think that they can trace the domestication of the horse to the very earliest Neolithic, and perhaps even the Palæolithic, times.[11] The urus, which, along with the bison, first appeared in Palæolithic days, was the characteristic wild ox of Neolithic times. He lingered on sparingly throughout the Bronze Age, and became extinct before the Roman occupation. The Celtic shorthorn, just referred to, was the domestic ox of the Neolithic and Bronze Ages ; the Romans are believed to have crossed the breed with an Italian race. Of this mixed breed, our Chillingham white cattle, if regarded as truly wild, are probably to-day the nearest feral representatives.[12] But Dr. Henry Woodward thinks that the Chillingham cattle may be the surviving descendants, greatly reduced in size, of *Bos primigenius*.[13] Darwin held the same view, and Lord Avebury claims that this is the opinion obtaining generally among palæontologists.[14] Our longhorn cattle are by some considered to be a medieval importation from Holstein and the Low Countries ;[15] others think that they were brought into Ireland, at least, by Scandinavian invaders, somewhere between 500 and 1000 A.D.[16] The Celtic shorthorn, which had remained the type until the coming of the longhorn, is now represented only in Wales and Scotland, where the Celtic or Romano-Celtic inhabitants persist most strongly.

The brown bear was imported from Britain to Rome during the Roman occupation, and we have evidence that it did not die out here until Saxon or Danish times. The reindeer was still living in Caithness in 1159.[17] The wild boar was not extinct until about the year 1620, and it was not till towards the close of the seventeenth century that the last British wolf was killed in the Northern Highlands. The otter, though still with us, has peculiar claims to the notice of the archæologist, for Dr. Robert Munro considers that he has found prehistoric otter and beaver traps in peat bogs and near old pile dwellings in Germany, Scotland, and Wales. These objects are blocks of wood 2 or 3 feet long, with a central hole about 1 foot by 4 inches. There were transverse bars at the ends of the aperture, to which Dr. Munro thinks a movable stick could be attached.[18] Of yet greater interest to the Surrey student is the fact that the beaver seems to have given the name to the now insignificant Beverley Brook. This stream rises near Cheam, flows through Morden, skirts the Western side of Wimbledon Common, and, cutting through Richmond Park, enters the Thames at Barn Elms, doubtless a soaking swamp in prehistoric times. The river has almost finished its work of erosion, and it is difficult to picture it as the home of beavers ; but we know that these animals did not become extinct in England until the eleventh or twelfth century.

With rare accuracy, Mr. Rudyard Kipling, in his ' " Just So " Stories,' has indicated the condition of the county when the ' Pilgrims' Way ' was a prehistoric track :

> 'There runs a road by Merrow Down—
> A grassy track to-day it is—
> An hour out of Guildford town,
> Above the river Wey it is.
>
> * * * * *
>
> 'Then beavers built in Broadstonebrook,
> And made a swamp where Bramley stands ;
> And bears from Shere would come and look
> For Taffimai where Shamley stands.'

CHAPTER IV.

THE NEOLITHIC HOMES OF THE SURREY CORNER.

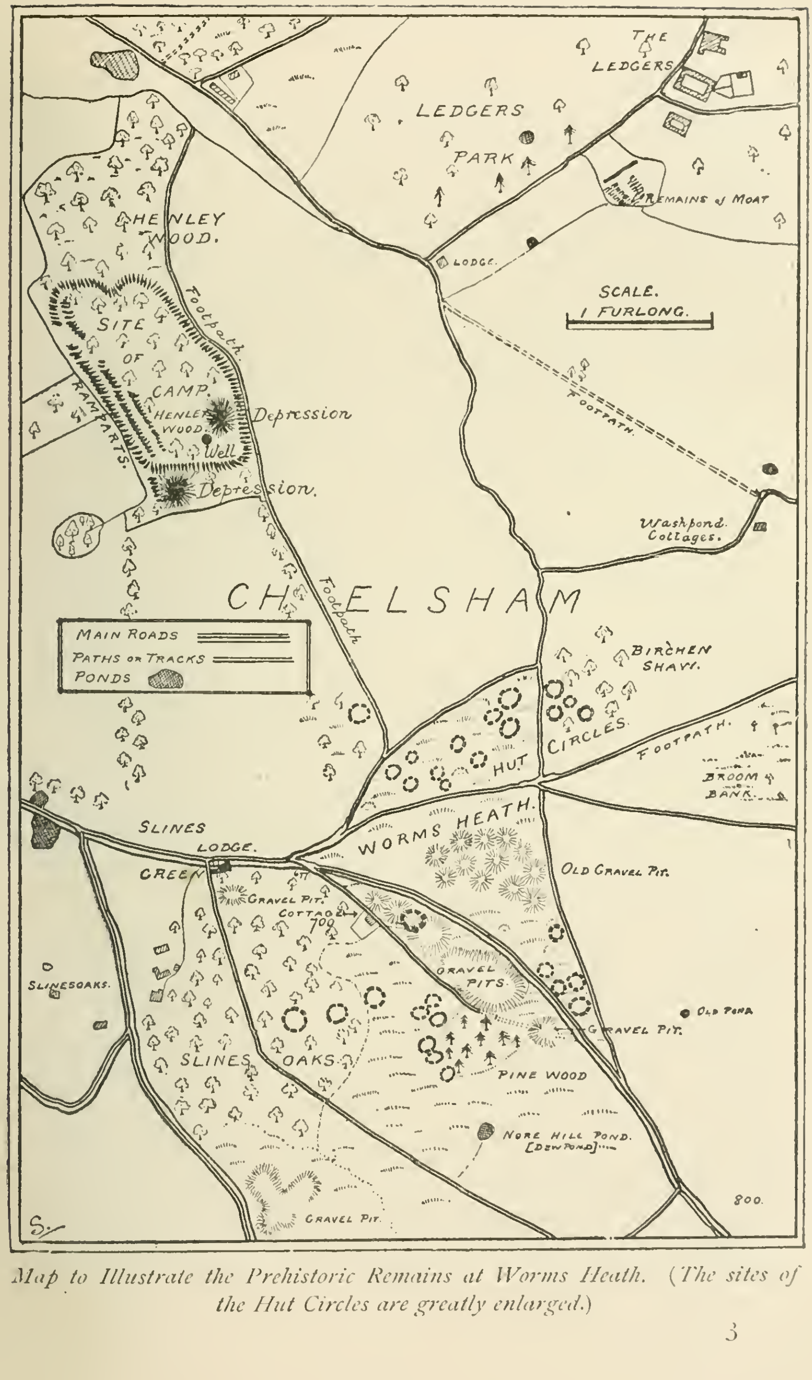
In ascertaining the nature of the dwellings of the Neolithic era, much help has been afforded by the investigations of explorers and anthropologists respecting the structures raised by tribes who are still in the stone or early metal stages. We need only mention the information yielded by Catlin's travels among the Red Indians, Miss Mary Kingsley's work in Western Africa, the journeys of Professor Henry Drummond and Sir H. M. Stanley in Central Africa, as typical of the mass of such knowledge. Recently we have reaped the fruits of the Rev. John Batchelor's twenty-five years' sojourn among the Ainus of Japan, and of Messrs. Spencer and Gillen's study of the native tribes of Central Australia. Of the two last-named workers, it has been said that they have given us the best description yet furnished of any people still in the Neolithic stage of culture.[1] The names of Avebury, Tylor, Keller, and Munro suggest the systematisation of records of this kind, which are constantly being verified and enriched by careful explorations.

By rocky shores and in the heart of inland ranges of limestone, Neolithic man frequently made his abode in natural caves, altered, if necessary, to suit his ideas of comfort and convenience. There, buried beneath the accumulations of ages, we find his bones and his tools, together with remains of the animals which he used for food. On pebbly beaches he would hollow out galleries in the shingle, and protect the entrances by barricades formed of larger stones. There we light upon the refuse of unnumbered meals, particularly the shells of oysters, mussels, periwinkles, and limpets. But the most typical Neolithic house in normal circumstances was a pit dwelling. This was a circular excavation in gravel or chalk from 5 to 10 feet deep. It was approached by a sloping shaft, or manhole, burrowed through the subsoil, and capable of being blocked up if safety demanded. The hut floor would be from 5 to 7 feet in diameter, but the aperture overhead was not more than half that width. In exceptional cases these dimensions are doubled. The aperture was commonly roofed with boughs of trees, heath, wattle and daub, or light flagstones. Sometimes traces of a central hearth may be discerned under the ruins, but, in general, a few flint flakes, a potsherd or two, with an occasional meal-pounder, are the only enduring relics. Groups of these pit dwellings, partially defaced and filled up, and known, from the shape of their ground-plan, as hut circles, are at times found surrounded by ramparts and ditches. Such a collection forms a fortified Neolithic village, though it usually is simply termed an earthwork or camp. It must not be supposed that groups of hut circles are found only in this position. They are often at some distance from the stockaded camp, which was, in that case, probably only a temporary refuge. Even when there are only scanty signs of habitation within the circuit, the hut circles outside may extend for a mile or more.[2]

In 1856, the Rev. Thomas Hugo stated that he had once seen numerous hut circles on Wimbledon Common, between ‘ Cæsar's Camp ’ and the windmill, but that the traces were then lost.[3] Manning and Bray, writing in 1811, speak of three ‘ wells ’ at Woodcote, but, considering other scraps of evidence, the likelihood that Woodcote is the ancient Noviomagus, and that Neolithic remains are plentiful there, it is possible that the cavities were hut circles. If they were indeed ‘wells,’ they still help to confirm the conclusions as to Noviomagus.

A fine group of hut circles, very numerous, and in most instances untouched by the spoiler, still exists at Worms Heath, in the parish of Chelsham. The circles, so far as we know, have been neither excavated nor recorded, but many have been defaced and tampered with by digging for gravel. The spot plainly represents a prehistoric settlement. The Ordnance six-inch map marks a triangular field to the East of the moor as ‘Camp—supposed British remains.’ Missing the hut circles, the surveyors evidently relied on local tradition, for in the field there is no visible trace of a camp, although it is true that a trough-like valley runs through the middle, and forms a kind of natural fosse. By a strange omission, a camp in a wood half a mile away escaped the map-makers (see map, p. 33).

Worms Heath is situated on an outlier of the Oldhaven and Blackheath beds, and these are extensively worked for gravel. The gravel-pits themselves are worth a visit, for they have a wealth of colour, rivalling, if not surpassing, that of the sands of Alum Bay. Buffs and russets and vivid crimsons predominate in the broad patches, but streaks and pockets of slaty gray and light blue are so interspersed as to excite admiration in the dullest mind. Below, at the foot of the tableland, the junction with the Chalk is seen in a good section or two ; perhaps a remnant of the Thanet Sands is also present. The landscape is picturesque and varied. The chalk hills rise towards the south, like a confluent series of ‘Hog’s Backs,’ the fluted and furrowed portions being often occupied by young plantations. Here a ridge is quite bare, save for turf ; there we see gorse and broom, yonder a copse of birches. A line of yews, some of them old, runs, with breaks, from below Beech Farm towards Hogerty Hill Plantation. Away to the South-West, four miles distant, at about the same elevation as that of the Heath, is the old camp at White Hill, clearly picked out by the modern water-tower.



Map to Illustrate the Prehistoric Remains at Worms Heath. (The sites of the Hut Circles are greatly enlarged.)

To the left of the main road which leads from Warlingham to Titsey the circles have been much mutilated, and huge mounds of gravel seem to forbid expectations. But around and in the wood called Birchen Shaw are many circles, easily detected. Their diameters vary from a few feet to a few yards, the depths from about two feet to a yard or a yard and a half. This does not give us the original depth, for the bottoms are covered with a layer of mould and humus. To the right of the road above mentioned, at the Northern end of the heath, where a by-road leads to Chelsham, are the chief gravel-pits, approached by a cart-track which passes a cottage. These pits are fringed on the Western side by a gravelly cliff, partly produced by the excavations, but partly due to a natural gully which is a continuation of the diggings. The moor above the top of this steep face is a moss-grown plateau, devoid, for a considerable space, of heather and bracken. Here are some fine circles, and the line continues round a small, unnamed pinewood, terminating near a dew-pond. It is just possible that some modern stock-farmer enlarged and deepened a hut dwelling, puddled the bottom, and so formed a pond for sheep and oxen ; but from considerations shortly to be submitted, there is at least a probability that the pond dates from early times. We think that explorations at Worms Heath, carefully carried out under responsible guidance, would lead to good results.

There are three circular depressions on Farley (or Farleigh) Green, and four on Little Farley Green, not far from the Worms Heath pits. But at Farley the soil consists of ‘ clay with flints,’ and there is no clear reason for considering these scattered pits as of prehistoric date. An old man recently told the Rev. F. Bennett, of Farley, that he remembered having seen the pits used for singlestick combats, though this can scarcely have been the original purpose. It may be well to recall, in this connection, the cockpit still existing on Chislehurst Green, just a little outside our district.

At Barrow Hill, on the chalk ridge South of Woldingham, there appears to have been a collection of pit dwellings. They have been much disturbed, and are said by the natives to have been simply diggings for chalk, 'a long time ago.' Why chalk should be required at that spot is a puzzle. The soil of the fields is chalky enough already, and chalk for lime-burning could be more cheaply and easily obtained lower down the hill. We once found, amid the leaf-covered excavations, an attractive, glossy white flake-knife ; perhaps other scraps could be found. But as the name Barrow Hill is apparently a guess on the part of the Ordnance Surveyors, instigated by the name of the farm Barrow Green on the plain below, we hesitate to claim hut circles here.

Our list does not end with this catalogue, for within the present generation the explorations of Mr. George Clinch have yielded splendid results, and doubtless there is room for further discoveries. Mr. Clinch, whose labours have been carried on near the Kent and Surrey borderland, started his fascinating work in 1878, and continued it almost to the close of the last century. His discoveries and conclusions were laid before the Anthropological Institute in 1899. In all, about 150 Neolithic hut circles were excavated, chiefly at Hayes, Keston, and West Wickham, in Kent, but only just across the Surrey boundary. In Surrey itself excavations were made at Shirley and Croham Hurst, near Croydon.

Three kinds of hut circles were noted at Croham Hurst and Hayes. The first were large ones, from 9 yards to 18 yards in diameter, and from 2 feet to about 6 feet deep ; these were upon, or near, the crest of the hill. Next were circles, smaller and shallower, often in pairs, situated half-way down the steep slope. The hut floor was covered with a foot of compact peat ; below this was the gravel of the original dwelling. This layer seems slight, but the peat was of a kind which forms very slowly, and anyone acquainted with Croham Hurst will readily appreciate the lapse of time which such a small thickness may represent. The third kind consisted of round pits, very even and uniform in construction, and from 4 feet to 10 feet in diameter. These pits, from their size, and from the fact of their containing charcoal in cubical masses and in powder, as well as reddened pebbles, were identified as hearths. A confirmatory fact was noticed ; the small pits did not possess an entrance-way, cut through the encircling mound. This mound, it should be explained, consisted of piled-up earth removed in digging the hole for the dwelling ; it would, in the actual residential pits, give additional warmth and shelter, and at the same time carry off part of the rainfall.

One hut circle was found to have two compartments, the second being rectangular in groundplan. Many of the large circles had a low conical mound in the centre. This may have been a sort of couch for reclining, but Mr. Clinch favours the theory that it supported the tree-trunk on which rested the rafters, consisting of selected branches. No signs of fire were discovered in the large circles ; if we consider the inflammable nature of the roof, were the covering heather, branches, or bracken, we seem to get the explanation. Mr. Clinch concluded that the huts were the abodes of peaceful Neolithic herdsmen, who had their winter shelter on the hills, but who in summer descended to the fertile plains around West Wickham. Croham Hurst was probably well timbered, as it is to-day ; its scrubby undergrowth would probably be denser and more suited for protection from storm and blast. Flint relics were found in all the localities explored, but sparingly at Croham Hurst and Shirley. Scrapers, arrow-heads, spear-heads, and pounders were among the harvest of treasures. At Millfield, Keston, there were so many flakes from which the pointed ends had been broken that Mr. Clinch thinks the place must have been a factory for arrow-tips or sickle-teeth.[4] Here it may not be amiss to chronicle a unique discovery made in June, 1902. The excavation of a sewer trench in some private grounds at Waddon, near Croydon, disclosed three underground structures, probably part of a group. Mr. Clinch, who again undertook the examination

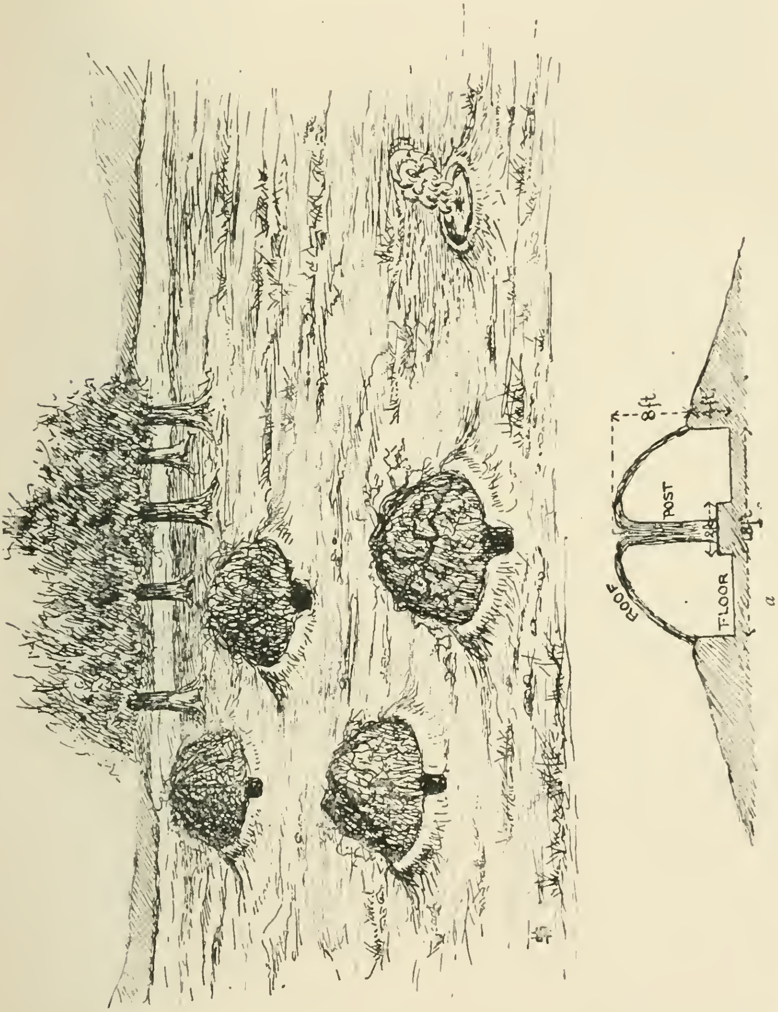


Fig. 2.—*Ideal Restoration of Pit-dwellings on Worms Heath.*
a. Vertical Section of Pit-dwelling.

of the pits, considers that they were prehistoric habitations, though primarily hollowed out as sepulchral chambers. In describing the caves, or chambers, before the British

Association at Belfast, in 1902, Mr. Clinch said that they were cut in beds of Thanet Sands. Each chamber was of beehive shape, about 7 feet high, and 12 feet in diameter. The chamber floor, formed of compacted material, was 15 feet below the ground level, and the caves, at the time of the discovery, were almost filled with sand and 'made earth.' The relics dug out comprised flint chips, cores, and scrapers, calcined flints, green-coated flints, from which flakes had been struck, pieces of millstone grit, probably portions of a quern, fragments of Romano-British pottery, with bones and teeth of the ox, sheep, and boar. No human bones were found, but on the sides of the chambers were undecipherable scratches, perchance of human origin. Professor W. Boyd-Dawkins considered that, as the evidence stood, the caves were ancient dwellings, not tombs. These subterranean chambers resemble, in one important particular, the much-debated deneholes, which have hitherto been deemed of historic date; the structures were apparently part of a group. There the likeness ended, for the entrance to each cave, instead of being at the bottom of a deep pit or 'well,' and accessible, therefore, from above, consisted of a square hole at the side of the slope.[5]

During the summer of 1902 we discovered the remains of many hut circles on Banstead Heath, though in some instances it was slightly difficult for the careless observer to distinguish these from the numerous gravel-pits so freely scattered about the Common. Some pits were obliterated by the levellings carried out to prepare golf-links. [See note, p. 41.]

Another kind of primitive house is known as the lake-dwelling or pile-dwelling. This was a structure, raised for reasons of defence and protection, on piles driven into a morass, or into the bed of a mere or lake, either near the margin or at some distance from the shore. The last kind of site was approached by a mole, gangway, or causeway, sloping down from the shore. A platform of planks rested on the piles, and on this shelf the hut was reared. The sides were of wattles, or twisted osiers, plastered with clay : usually the roof would be thatched with reeds or heath. A collection of these houses formed a lake village, and the whole must have afforded a safe retreat from wild beasts or unfriendly tribes. A different kind of dwelling, though erected with the same intention, was the crannog, often loosely considered as an ordinary lake-dwelling. The crannog consisted of a natural island, or of a clayey shallow, artificially converted into an island by heaping up logs, brush, and stones, and staking these together by means of piles. On this base, round huts, encircled by a stockade, were built. As in the former case, the structure was of wicker or hurdle work, daubed with clay. The crannog does not appear to have been a characteristic English dwelling.

Pile-dwellings, using the term to cover both kinds of structure, were common to the Stone, Bronze, and Iron periods ; some examples continued through all three stages, as witnessed by the relics found when disentombing the structures from the alluvium or peat. For a particular house might decay, or a village be burnt down, or articles of use and waste materials be dropped into the waters below, so that we get a chain of evidence showing gentle transitions of custom. Piles from Swiss lake-dwellings have sometimes exhibited cuts manifestly made by stone axes. From Danish peat-bogs piles have been extracted showing traces of fire and hatchet marks, and accidental corroboration of the interpretation has been afforded by stone axes lying in close proximity.[6] By digging under the ancient platforms, the bones of animals are found to lie side by side with stone or metal tools, ornaments, pieces of pottery, carbonised cereals, and fruits, and other objects, so that the patient explorer can expound the riddle of the forgotten villagers.

Some of the later pile-dwellings were built of logs and planks, mortised or pinned together with pegs, revealing a knowledge of metals. Lake-dwellings, famous among archæologists, have been discovered and investigated at

Glastonbury, also in Norfolk, Suffolk, and Holderness. At the hill fort of Grimsbury, near Newbury, remains have been reported.[7] Quite recently there was recorded from Skitts Hill, near Braintree, a dwelling which extended in time till the Bronze period, if not, as some suppose, built during that period.[8] It is believed that this kind of habitation was once common by the Thames side (Fig. 3). One such building was, in 1894, uncovered at Hedsor, Bucks, and the piles identified as made of beech. Remains of the pig and deer were noted.[9] But we have records of traces nearer home.

While making the foundations of a wool warehouse in Moorfields, near London Wall, a generation ago, unmistakable signs of pile houses were laid bare. General Pitt-Rivers, who read a paper on the subject in 1866, stated that the remains were found in a section of which the upper layer was composed of modern accumulations of rubbish. Below this was a bed of peat, from 7 feet to 9 feet thick, and under this was a stratum of gravel varying from 17 feet to 22 feet in depth. The decayed tops of the piles, which were of oak and elm, projected above the peat, but whilst some of the points were embedded from 1 foot to 2 feet in the gravel, others had a lower termination than the primary ones. Thus there was evidence of two ages of building and of successive renewal. There was no trace of iron-shoeing or metal-fastening of the piles. The vast majority of the relics found in the peat were undoubtedly Roman. They consisted of pottery, bronze and copper pins, an iron and bronze stylus, shears, tweezers, etc. Other objects, such as handles and points of bone, and bone skates, were thought to belong to the older stage, represented by the lower piles. On the Surrey side of the river, in New Southwark Street, similar remains, found under like conditions, were unearthed, and General Pitt-Rivers thought it probable that many other dwellings had turned up, and had been destroyed without receiving attention.[10] The marshy character of this stretch in early times may be appreciated when we remember that it is scarcely two hundred years ago since Moorfields was an undrained swamp.[11] In the winter of 1901-1902 our friend, Mr. F. W. Reader, made a careful investigation of pile-dwellings of Roman date which occupied the filled-up bed of the Wallbrook, in the vicinity of Finsbury Circus and London Wall. The objects discovered included various kinds of pottery, implements of iron, and fibulæ. A full account of these, with sections and maps of the district, was presented before the Anthropological Institute in November, 1902. It is only proper to add that Mr. Reader states that he does not perceive traces of Celtic influence in the undoubted Roman work.

Of the 'dug-out' boats of the lake dwellers, produced by scooping and burning out a hollow in the trunk of a tree, a specimen was found by some labourers in 1900, whilst cutting through the alluvium of the old bed of the Lea, at Tottenham. This boat was 14 feet 10 inches long by 2 feet 4 inches wide ; it had a depth of 16 inches.[12] We cannot claim it for Surrey, but it must have been in such boats, sheetless and rudderless, that the Neolithic men of our corner

> 'Through long Biscayan waves
> Star-steer'd adventurous from the Iberian shore.'

NOTE TO PAGE 38.

Whilst this chapter was in the press, we received, through the kindness of Mr. W. J. Nichols, of Chislehurst, an account of his remarkable discoveries of 'hypogeal passages' in the chalk near Chislehurst Railway Station. Mr. Nichols, who read a paper on the subject before the British Archæological Association at Sheffield in August, 1903, explored about four miles of these subterranean galleries. They are excavated in the solid chalk at a depth of about 6 feet below the Thanet Sands. Each gallery is from 10 to 12 feet high, and from 12 to 15 feet wide, narrowing to about 7 feet at the roof. One gallery, 4 feet wide and 5 feet high, had several sharp turns; its labyrinthine windings formerly terminated in a chamber, the only entrance to which was a small hole at the ground level. Mr Nichols thinks that he has also found 'altar tables, formed in the chalk, within a point or two of true orientation. This might, however, be accidental.' The age and object of the excavations are unknown. It is considered that they may have been made by the Romans for obtaining flint, or, later, by the Saxons to procure chalk. Within a few hundred yards from these galleries are about seventy dene-holes, some being very deep, supposed to belong to the late Celtic or Iron Age.

Previously, in 1884, Mr. Nichols had excavated some pit dwellings in Toot Hill Wood, on very high ground, near Beckenham. There, at a depth of about 2 feet in peat or vegetable matter, he discovered burnt bones, teeth of the horse, rough pottery, and flint tools, together with considerable traces of iron, and mediæval coins. A full account will be found in the *Proceedings of the Society of Antiquaries* (2nd Series, xii., p. 346). The name Toot should be noticed, as it is said to be 'used generally in connection with tumuli, or a watch or beacon point.'

Fig. 3.—*An Ancient Thames-side Hamlet.* (*Imaginary Restoration.*)

CHAPTER V.

THE NEOLITHIC PEOPLE OF SURREY AT WORK.

BESIDES his occupation as a maker of tools and weapons, which will be spoken of later, the Neolithic man had many other crafts to ply. At the outset, a distinction must be made between the agricultural customs of the Iberians or non-Aryan people, and those of the branch of the Aryans known as Goidels. Mr. G. L. Gomme has elicited, by a painstaking comparison between Aryan and non-Aryan races still living in India, that the Iberian farmers settled on the hilltops, and gradually extended cultivation downwards as far as was considered prudent. The succeeding husbandmen—Goidels, Brythons, and Teutons, planted their homesteads in the fertile valleys. The homestead was backed, in order of ascent, by meadows, arable fields, and lastly, when the land became too steep for the plough, by sheepwalks and woodlands.

The method of cultivation most favoured by the Iberian was ordinarily that of raised terraces, now known indifferently as lynches, lynchets, linchets, or landchets. Fine remains of lynchets are visible on the hills at Shawford, in Hampshire ; Worth Matravers, in the Isle of Purbeck ; Luton, in Bedfordshire, and other places, making in all a very long list.[1] In terrace cultivation, the land on the upper parts of a hill has the appearance of a set of receding shelves, or a staircase, with the ' tread ' somewhat wide in proportion. The immense time and the unceasing toil requisite for the construction of these lynchets, and for the raising of the hill forts with which they are often connected, cannot be adequately realised by anyone who is too much influenced by the considerations of modern economical conditions.

Mr. Gomme has attempted to prove, and, from our own inspection of numerous examples, we think successfully, that this kind of farming could not have been carried out by the plough. The ' balks ' or ledges are too narrow, the rising portions too vertical, and the hill slopes frequently too steep. Exceptions, or rather, analogous modes of shelf tillage, occur on a few hills having gently falling sides. These examples have the team-cultivated strips of considerable breadth, and may be of mediæval date, or even of the Georgian era.

All this is not mere hypothesis. In India, to-day, aboriginal non-Aryan hill tribes are frequently found retaining their hold of lofty districts, whilst their Aryan conquerors occupy the plains below. The hill folk cultivate their terraces by the aid of a long, square-headed dáo, or hand-bill, and a light hoe.[2] Indeed, these are the only implements which the Indian Angámis Nágás, a lynchet-making tribe, possess. India offers a fairly complete parallel to Britain, extending even to the totemism of the non-Aryans, and its adoption by the Aryans ; to the grafting of the Iberian Druidical cult and a priestly caste upon the Goidelic over-lords ; and to the almost certain race-amalgamation which to some extent took place.

It is a tolerably safe deduction that the Iberian or non-Aryan farmers of Britain employed implements of a character as simple as those of their Hindoo peers in correlative circumstances. The Highland spade, figured by Mr. Gomme, is almost as rude as the wooden digging-sticks of the Tahitians and Fijians.[3] Until late years the Maoris used a similar tool. One has only to replace the iron plate which cuts the soil by a tongue-shaped or crescented blade of stone and he will get a digging-stick such as the Neolithic men doubtless used. Professor Joly speaks of curved flints which were found on the banks of the Mississippi, and which he surmises were used as spades.[4]

A slight development is displayed in the Highland caschrom, or foot-plough, of which illustrations are given by Mr. Gomme and Sir Arthur Mitchell.[5] The caschrom is a crooked piece of wood, which has the lower portion projecting at an obtuse angle. This portion is tipped with iron. The head of the caschrom is driven into the ground by the labourer's right foot, after which the clod is easily prised from its bed. Sir Arthur Mitchell states that, in 1880, the foot-plough was in use in the Hebrides and the Western side of the Scottish mainland. Speaking of small fields where the soil is soft or peaty, he makes this notable assertion : 'Certainly no plough, whether one or two stilted, could take its place and do its work.'

It seems to us that the slightly curved celt (Figs. 23 and 24), found by us at Headley, was intended for a hoe, or, if shafted at a more obtuse angle than is suggested in Fig. 24, it may have formed the armature of a foot-plough, to which it could be attached by thongs.[6] We say this, although the Headley folk were probably of the Goidelic, or at least, transitional type, as the site chosen would seem to imply. The valley below is loamy and easily tilled. Sir John Evans thinks it by no means improbable that some of our ruder unpolished implements were employed in agriculture, like the so-called shovels and hoes of flint described by Professor Rau.[7] Mr. George Clinch considered that some of the implements found by him in Kent and Surrey were used in clearing and scarifying the ground,[8] and this idea has impressed other investigators.

We have to confess that, within our nook of Surrey, we can identify no absolutely certain traces of shelves, denoting terrace tillage. There are artificial balks, possibly remains of lynchets, on the Downs above Chipstead Bottom, on the South of Box Hill, and on Riddlesdown, but the evidence is not decisive. The most likely example occurs in the

Titsey Woods at Botley Hill (883 feet), where there are at least three terraces, said to have been used once as carriage-drives, but apparently widened shelves, purposely left untouched during the wheat cultivation of the eighteenth and nineteenth centuries. Lynchets may not have been universally needed. The summits of many of the Downs curve so gently, that the necessity for terraces might perhaps be obviated, whilst at the same time, the slope towards the base, is sufficiently precipitous for a natural defence. If lynchets ever existed in this area, they may have been obliterated by centuries of plough culture, since the surface is well suited to that implement. It is only where there has been continuous and permanent pasture that we could look for the remains of terraces.

There is the negative side to be considered. The Iberians were not accustomed to cultivate the plains, and as regards Surrey, they could not do so easily. Northwards, the clay belts would cause even better husbandmen to reflect before tillage was attempted. Southwards was the Wealden anticline, with its plains, the haunt of wild beasts, a region impenetrably wooded, girt with morasses, and possessing no thoroughfare. Mr. Topley once made an exhaustive examination of the places on the faces of the chalk escarpment around the Weald. Out of 125 parishes, he noticed that 119 belong to villages situated at the foot. The dwellings are built at the foot, but the cultivation is carried from below upwards, after the manner of the Aryans, who were essentially farmers of the vale. The six exceptions are due to perfectly explainable causes, and are exceptions in name only.[9] One may safely conclude that the first real farmers of the Weald were therefore Aryan, and it is likely that they were neither of the Goidelic nor Brythonic section, but Teuton migrants of a much later period. At the foot of the chalk rampart, there would be a sheltered farmstead, a productive soil, and plenty of good water. But what of the earlier Iberian hill folk ? They must have tilled the ground somewhere, and the presumption is, that their corn patches were on the hilltops. Defensive positions were to them paramount, the quality of the soil was of minor importance.

Where did the Iberians find a water-supply near their elevated villages? We suggest that they found it in the dew-ponds, those shallow depressions seen on the summit of the Downs at Warlingham, Titsey, and elsewhere, which, when well rammed or puddled, hardly ever go dry, depressions which were a standing marvel to such acute observers as Gilbert White and Richard Jefferies. The explanation of the phenomenon of dew-ponds was beyond either of these naturalists, as it is still beyond thinkers well trained in physical science.[10] But it is a fact that even in our own time, the dew-ponds, or, as some old Surrey people call them, mist-ponds, are so efficacious as reservoirs, that the strange spectacle is seen of carts being sent uphill to procure water for the granges and bartons in the vale. It follows, that, at the worst, the Iberian would be in no more grievous state than the modern husbandman, unless he foolishly reached out to the dry chalk bottoms. Recollection must also be made of the moistness of the climate in those days.

Let us suppose that the non-Aryan villagers came lower down the slopes with their hoes and their clod-crushers. The dry coombes of the Downs are now proverbial, but were they always dry? Nay, rather, are they always in a state of drought to-day? After a season of excessive rainfall, the ordinary natural agencies are unable to carry away all the water, and 'nailbournes,' or intermittent springs, make their appearance.[11] The present spring supply of Croydon is supplemented by two such bournes, which previous to the building of a culvert in 1850, periodically inundated the town.[12] Even afterwards, in 1852, 1866, 1873 and 1893, a voluminous supply was furnished. Other bournes will be noticed incidentally in a different connection. In Neolithic times, the rainfall was probably sufficient to render these bournes nearly permanent, moreover the super-saturation of the chalk would cause springs to crop out at a higher level than nowadays.[13] The enormous amount of London water now derived from the chalk will tend to make the appearance of the bournes more and more rare.

The little plots of wheat and barley sown by the Neolithic men must have yielded scanty crops. Through what ages the cultivation of cereals had proceeded in order to make the grain even barely tolerable in the ear, who shall say, or from what wilding,—goat grass, or other members of the *Gramineæ*, the wheat was first derived? We do know how little progress had been made in perfecting of wheat in the historic period, until the Lancashire brothers Garton commenced a system of scientific cross-fertilisation. The flax, grown for the sake of its fibres in weaving, probably looked much the same by the Neolithic Mole as by the Ouse of the Iron Stage.

The corn was gathered, we take it, with sickles of flint, the stubble left behind being very long and ragged. A handsome specimen of a sickle gracefully curved, and having fine, wavy markings, was in 1868 dredged up from the Thames bed at Chelsea, and now rests in the British Museum. Another Thames specimen is to be seen at Jermyn Street. Pytheas, whose observations relate to the epoch when the Brythons held sway in the South of England, says that in the South-East the sheaves of corn were threshed in barns. Belerion, later in the same period, states that the ears were cut off and stored underground, and that the longest kept were fetched out every day. Customs are hard to eradicate; we remember seeing, not more than a quarter of a century ago, an acre field of wheat, where the ears were all tediously snipped off by a pair of shears!

Whether we select the Neolithic or the Bronze Age for enquiry, we shall find that husbandry carried with it the related business of milling and baking, hence the occurrence, in the Surrey corner, of pounders and meal crushers, the forerunners of the quern. Hence also, the discovery of 'pot-boilers,' which we shall describe fully in the next chapter. The manner in which the flint pounders are flaked, shows that some were fitted for use in the right hand, and others for the left. As the same property is possessed by awls and borers, we conclude that these priscan people were ambidextrous. To the women were assigned the tasks of grinding corn and baking bread, of gathering roots and crushing them to a pulp. If comparative custom teaches us anything, it tells us that women also were the first agriculturists ; they had to scrape and dig the ground with their stone hoes and picks. The men, though not primarily hunters, like the Palæolithic folk, would chase the badger, hare, and rabbit with their javelins and flint arrows. Many a wild ox and bristly boar dropped into Neolithic pitfalls, there to be spiked on sharpened stakes of wood. Men were also the fishermen of the tribe. Seated in a dug-out boat which floated on an old-world tributary of the Thames, the Iberian speared the pike or angled for trout or chub. His fish-hooks were crescentic flakes or spalls of flint or other silicious material. Occasionally, too, he employed nets of wicker-work.

If the introduction of the cereals marked a great advance, the domestication of animals was scarcely less a leap forward. Most solicitously did he tend his sturdy shorthorns, his lank, high-backed hogs, and his hard-fleshed sheep—dolorous creatures, when contrasted with the modern sheep of the North Downs. There were horses to be 'broken in,' oxen to be haltered, sheep to be shorn, fleeces to be washed, and hides to be scraped, softened, pegged out, and dried. Gaunt dogs, grim as winter wolves, shyly waited for scraps of offal, and sidled round the primitive cooking-pot. The wilder dogs slunk to the woods at nightfall, but in course of time the tamer ones became man's faithful companions. Then the men would have to construct tribal camps, and sink the underground houses, roofing them with the spoil of the 'self-sprung forest.'

The flax was spun by means of a rude spindle, and woven by the help of a primitive loom. Were not most of our

Surrey barrows destroyed, we might hope to find in them spindle whorls and other relics of these arts. Very coarse were the Neolithic linen and flannel ; many of the hunters would prefer to wear the skin of a deer or the pelt of a sheep. Women might fill up their leisure by making amulets and necklaces of jet, bone, amber, cannel coal, or Kimmeridge shale. They might also decorate their bodies with red ochre and grease. Professor Virchow found a coating of iron oxide on a skull taken from a Neolithic barrow ; he believed that the pigment was from the toilet case of the deceased person. We ourselves have met with lumps of peroxide of iron in the Neolithic tufaceous deposit in Purbeck Isle, and in an ancient midden, with other relics of man, at Wyke, in Dorset. Lumps of considerable size are to be picked up at Worms Heath and Walton, where hut circles are common.

The superstitious side of life appealed to the Iberian ; his religious ceremonies will be referred to again. Roundlets of bone were sawn from the human skull and worn as charms. Trepanning, partly for surgical, and partly for superstitious reasons, was common, as the barrow-digger can testify. Little figures of cannel coal and whalebone have been discovered, crudely fashioned to resemble the human countenance, and pierced for suspension as charms.[14] Domestic articles, such as pins, needles, and bodkins, were sawn and carved out of bone, and smoothed with flint scrapers. Skins were pierced with flint or bone awls, and fastened together with fibres or strips of hide. Thongs of hide also furnished the means of securely attaching axes and hoes to their shafts ; the thongs would be lashed whilst still fresh. Trees had to be cut down, riven with flint wedges, and planed with the larger kind of scrapers. Arrow shafts must be cut and smoothed, and preparatory to the fixing of the tips. Wooden pipkins had to be scooped out, and other domestic utensils carved from stems and small logs. As the Goidels gradually brought bronze tools into vogue, better work would be accomplished, and squared and mortised beams would appear. The coarse meal pipkin would give place to more tasteful bowls. Drinking cups, for mead and whiskey, would be gracefully hollowed. The Neolithic people also moulded coarse clay and allowed it to be sun-dried for pottery. The ornamentation of this pottery was of the simplest—a few zigzags, cable impressions from twisted fibres, triangles, or thumb-dents. The mention of pottery now leads us to speak of the food of Neolithic man, of what it consisted, and how it was cooked.

CHAPTER VI.

NEOLITHIC FOOD AND COOKING.

Mr. Worthington G. Smith, in his 'Man the Primeval Savage,' has given us a fanciful, but most illuminating description of the food of Palæolithic man. Having made the alterations necessitated by the change of fauna, we notice that the dietary therein sketched out would largely serve for the Neolithic settlers.

The Urus (*Bos primigenius*) was perhaps the largest animal pursued by the Iberian hunter. Its bones and teeth have been found alongside of Neolithic remains in the flint factory at Cissbury, and its bones abounded among the ruined pile-dwellings of Barton Mere, near Bury St. Edmunds. The newer man also chased the stag, elk, wild boar, and roe. Whether by trap or otherwise, we know that man captured the otter and beaver. Seeking quarry among the bird tribe, he struck down the wild duck, goose, swan, and capercaillie ; his flint arrow-tips caused these creatures to die of painful wounds. It has, indeed, been supposed that certain triangular arrow-heads were mounted base foremost, so as to kill the bird by a stunning blow, thus preventing the plumage being blood-stained, and unfit for decorative purposes. His larder was also stocked with fresh-water fish.

By the sea-shore, innumerable mussels, whelks, and oysters supplied his staple diet. Mr. Andrew Lang thus puts it :

> 'He lived in a cave by the seas,
> He lived upon oysters and foes.'

But the last two words involve a theory not demonstrably true, though cannibalism may have been practised on rare occasions. Neolithic man ate freely of the produce of his fields, but the bread must have been coarse and heavy. His stalls and pens furnished him with oxen, sheep, pigs, and goats. If hard driven, he partook sparingly of the flesh of the horse and dog. In some spots the bones of horses are very plentiful. The Neolithic dairy contained milk and cheese ; wild bees gave sweets to the household ; and there were many edible herbs in the woods and hedgerows. Dessert, in the shape of blackberries, sloes, wild cherries, hazelnuts, beech-nuts, and acorns, could always be obtained at the proper seasons. Where the food of the farmer differed most from his hunting predecessor, was in the preparations of meal, obtained from his cereals—the second-comer had cakes with his ale.

Some years ago an unexpected, but none the less welcome, source of evidence as to primitive food revealed itself to a patient investigator. A Neolithic barrow had been opened on Warminster Downs by Mr. W. Cunnington, who allowed Mr. T. Charters White to examine the jaws of one of the exhumed skeletons. Mr. White noticed that the lower teeth were almost covered with ' tartar '—that is, the hard concrete formed by the precipitation of lime salts, which are not soluble in the ordinary alkaline liquids of the mouth. He therefore cleared off this tartar, dissolved it in weak hydrochloric acid, washed the sediment, and examined the residue, drop by drop, under the microscope. Originally imprisoned in the calculus, but now liberated by the acid, were amorphous particles, probably disintegrated meal from cereals. There were also, interspersed among these, silicious granules, due to the erosion of the molar teeth. Under polarised light, other flinty granules were observed, which did not answer to the former test. An eminent geologist pronounced these particles to be quartzite ; they were apparently the rubbings from the mortar in which the corn had been ground. Among the other vestiges were oval, horny cells, like those of the parenchyma, or thin-walled, young, cellular tissue, of apples. There were also husks of corn with the adherent outside hairs, and the pointed tip of a fishtooth. There was no evidence of the use of fire in cooking the food, but Mr. White hopes that other investigators will carry on these laboratory experiments, and thus render themselves valuable allies of the out-of-door archæologist.[1]

That there was in Neolithic times cookery of a comparatively elaborate kind is attested by charred remains of food, by fire-marked flints, known as 'pot-boilers,' and by the general customs of semi-civilised races. In some cases the meat was baked directly, by placing it on glowing embers or on heated stones. For boiling operations, a natural cavity in a rock was chosen, or, failing this, a hollow was made in the soil, and then carefully lined and puddled with impervious clay. The hole having been filled with water, a piece of raw flesh was put in; then flint stones, roundish, or roughly trimmed for the purpose, were heated white-hot. The watcher, having dexterously whipped out the flints one by one with a pair of long bones, a forked branch, or a green withe, threw them into the improvised pot, and so cooked his joint, which was, without doubt, usually 'underdone.' Skins also served as pots, a further development brought wooden pannikins, and lastly, pottery which would stand fire took the place of the old sun-baked, crumbly earthenware. It is interesting to notice that, in districts like Cornwall, the age of stone still continues with respect to cooking-utensils, for bowls of serpentine and other rocks are often employed by the peasantry.

The whole question of early cookery is an engaging one, and throws much light incidentally on other matters, but as it is fully treated by Lord Avebury, Dr. Tylor, Mr. Stevens, and other writers,[2] we content ourselves by a reference to the habits of savages as lately as 1901. In that year Dr. Roth prepared a bulletin on the food of the aborigines of Queensland. He found that their modes of cooking included roasting, baking, boiling, and occasionally grilling.

In roasting, the meat is just thrown on the ashes, whilst in baking the use of hot stones is commonly resorted to. Boiling is done in a bark trough, or more usually in a large shell. For grilling, the natives use a grill of crossed sticks. As flint flakes, mounted in handles with gum cement, are still used by these simple people, a comparison with the men of our late Neolithic stage would be a fair one.[3]

We may also allude to the cooking of our modern gipsies, performed, as it is, on the red-hot embers of a wood fire. The baking of hedgehogs, packed in clay, is particularly instructive. We lately saw another analogous method, evidently a strange survival, at Carew, in Pembrokeshire. A large oven is there used in common by several cottagers. A fire is lighted inside the oven until a good heat is reached. The ashes are then removed, the dough placed inside, and the huge door fixed and sealed up with clay. This mode of baking is said to be very efficient, and the custom by no means rare.

'Pot-boilers' alone form an attractive subject, for their presence in numbers is an unfailing proof of the activity of Neolithic man. We often recall the helpful advice given to certain young beginners by our friend Mr. W. H. Warr, of Eastleigh, an indefatigable worker in the archæological field for the past twenty years. 'Let pot-boilers be your guides. A few pot-boilers, a few stray flint flakes; abundance of these objects, many implements, and the probable site of a settlement, or a camping ground.' What is the appearance of a pot-boiler? It is, as previously stated, a flint, roughly spherical in shape, varying from 1 inch to 3 inches in diameter, and having a surface covered by a network of cracks (Fig. 4). The surface is sometimes dull and chalky-looking, in which case the friable nature of the outer layers denotes that it has been calcined only, and is not properly a pot-boiler, for the latter has been immersed in water. It perhaps was part of a heating layer for baking, and was, besides, the prototype of the asbestos of the modern fire-place. Where the exterior of the flint is glazed and porcellaneous, and its polygonal network finely meshed, there has been, not only heating, but swift cooling by contact with cold water afterwards.

We have made experiments which tend to prove that the pot-boilers must have been carefully chosen. Flints newly broken by a hammer or plough, or those fresh from the quarry, and therefore somewhat moist, splinter easily in the fire, and throw out fragments to some distance. Such specimens would have been useless, and slightly dangerous, to the Neolithic cook. Parenthetically, we may say that fire-riven flints are distinguishable from those fractured and broken up by the ordinary atmospheric agencies, and by contraction and expansion produced by heat and frost. The fired specimens have what Professor T. M'Kenny Hughes calls a 'hackly fracture.'

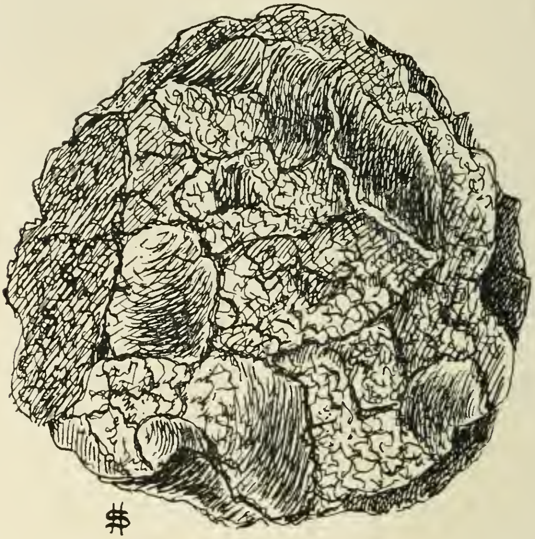


Fig. 4.—'*Pot-boiler*' (*Ewell*).

(Natural size.)

A well-worn pebble, from the Drift gravels, or from the

Oldhaven beds, for example, does not crack much until it has had several heatings and coolings, yet, for some reason, such pebbles do not seem to have been much favoured. For some time we had a suspicion that many of the so-called pot-boilers were simply the accidental outcome of 'turf-clamps,' or of those weed-fires by which the farmer tries to exterminate the noxious couch, twitch, or squitch grass (*Agropyrum repens*), whose creeping rhizomes or rootstocks interlace and form a dense mat. Further examination did not bear out this suspicion. On the positive side, there is plenty of evidence that pot-boilers occur where couch-grass fires can never, in all probability, have existed, as under the close-skinned turf of the Downs, or on land broken up for the first time after a rest of ages. Turf fires have presumably not been frequent in Ashtead Woods, yet the pot-boilers are common. A mere temporary forest fire would split the flints, and give them a reddish or rosy tint. And surely no one ever carried shaped flints to the clay surface of Ashtead Woods to await the chance of an accidental fire! The other explanation is the more reasonable. Negative proof is not wanting, where weed or beacon fires are known to have burnt, true pot-boilers were often rare, or absent altogether, though some flints bore a calcined appearance. It is questionable whether such fires, though they should last for weeks, would give the true, glossy surface found on the real pot-boiler, which, as we have said, is caused by sudden plunging in cold water. Granted, that after the hot remnants of such a fire had been raked over and dispersed, a sharp shower of rain might make the hot flints simulate the genuine pot-poilers, but this would be exceptional, and the expert might perhaps discriminate between the two kinds.

If the pot-boilers and calcined stones are Nature's accidents, why should the flints have, roughly speaking, a typical shape, with in some cases indisputable signs of previous chipping, and why should disused cores be at times pressed into service? It seems likely, too, that suitable cores or stones were often used many times over, since one heating and one cooling do not of necessity give the porcellaneous coating. There would be a limit ; were the operation repeated too frequently, the dark colour of the interior would disappear, and the flint be reduced to a brittle mass, which would soon crumble to a white powder.

Again, if we attribute these objects to couch fires, all flints in the neighbourhood should be metamorphosed, if not to the same degree, at least indifferently ; consequently, where worked flints are plentiful, knives and scrapers should have the meshwork and the glaze, but this is a rare occurrence.

At Wimbledon Common, especially near the Camp, where a few inches below the surface pot-boilers are numerous, agricultural weed-fires are unknown, but there are periodical gorse-fires. These conflagrations, however, as far as one may judge, merely blacken the exterior of the flints, crack open the mass, and tinge portions with a pink hue ; the reticulations in this case would be slight. The Wimbledon pot-boilers have, for us, an especial fascination, for, contemporaneously with our first observation of them some years ago, a friend was puzzling over them, each observer being ignorant of the records of the other. Long afterwards he spoke of the stones ; he, with the eye of a geologist, marvelled at seeing ' burnt flints ' among the mould above the drift gravels ; we could supply the clue.

In a field between Headley and Leatherhead large numbers of calcined flints and pot-boilers are to be seen. The adjacent fields have few specimens—at any rate, not more than the average amount. As flakes and implements do not occur in any comparable proportion, the burnt flints probably represent some temporary camping-ground, where much baking of meal and boiling of meat were done somewhat hurriedly by a tribe on the march.

In the summer of 1903, the removal of turf and soil to a depth of 6 inches to 12 inches on the Northern part of Banstead Heath revealed a veritable hearth, at least 20 yards in diameter. Here were calcined flints dense enough to form a layer of an inch or two, and it was noticeable that the material was generally in a fine, even powdery condition. The origin can only be conjectured.

The presence of calcined stones—'vitrified stones'—in camps and forts, Dr. Guest says, has been referred to beacon fires,[4] but this would not account for their general distribution in widely-severed localities, whether on hill or dale, nor would it explain why the beacon specimens should be similar to those found in ploughed fields. The vitrified flints from the stone-work of Roman towns are beside the question.

Calcined flints and pot-boilers, then, give great assistance in following the tracks of Neolithic man.[5] They furnish a wide scope for inquiry, and throw open a new question for corroboration or disproof as to their origin. And, at least, no one who has not tried the experiment can appreciate the effective manner in which water may be heated by their aid.

CHAPTER VII.

BURIALS AND BARROWS OF THE SURREY CORNER.

THE Neolithic people were totemistic, each clan having, as its distinguishing badge, some animal or natural object. This emblem at once compelled reverence and marked distinction of lineage.[1] A special body of seers or medicine-men, known to us as Druids, was set aside to cast auguries and offer sacrifices. The sacrifices were a prominent feature at the funeral of a chieftain, and it seems likely that human beings were among the victims. Grim rites and disgusting orgies and feasting appear to have accompanied the burial.

Neolithic burial-places are called barrows ; they are large mounds of earth, usually on the summit of a hill or on a tableland. In Iberian times the mounds were generally long or oval, and were sometimes as much as 300 feet in length. The smaller barrows often covered a heap of stones, the larger ones most commonly had chambers, galleries, and recesses, formed by slabs of stone. Other barrows were built over a dolmen—that is, a large capstone, supported by two or more upright blocks or slabs. Under the dolmen, or in the sepulchral gallery or chamber, the body was placed, with the knees doubled up to meet the chin, this huddled-up posture probably being the supposed counterpart of that of the unborn child, or a sleeping person. For much of the ceremonial was symbolical ; the very barrow, with its approaches and internal arrangements, represented the earthly house of the deceased. Cases are also recorded where the body was found sitting up on its haunches with its back towards the wall.

On opening the barrows, a fair proportion are found to contain celts and arrow-heads, some new and yet purposely broken, besides such objects as trinkets and coarse pottery. Into the significance of these relics we cannot enter, beyond stating that they were deemed to be of use to the dead person in the after-world ; the implements were often broken to allow the spirit confined in the object to be free for future use. Other objects deposited in barrows are the so-called incense and drinking cups of earthenware, cinerary urns, beads of jet and amber, bone pins and needles, earrings, buttons, etc. In the substance of the mound are discovered the remains of the ox, dog, sheep, and goat, boar tusks, and cleft and charred skulls of human beings. A study of these relics generally helps to fix the era of the interment. Where we find bronze objects in conjunction with those of stone, we know that the burial took place in the Bronze Age, and presumably before that age was much advanced, though this latter point must not be insisted upon in the absence of other evidence, since the ceremonial use of stone was very persistent.

In many cases flakes and worked flints are found scattered in the mound. Canon Greenwell has contended very effectively that such relics are not there by accident, but were most likely strewn about during the process of heaping up the barrow. The flints often occur in great numbers ; they are found in the body of the chalk rubble as well as in the surface soil, and exist in the hummock when the top soil of the land around has scanty traces of these relics. Chance seems thus precluded.[2] One is tempted to believe that our practice of scattering flowers in and on the grave is a survival of strewing of flints. At the burial of Ophelia, the priest utters the opinion that ‘shards, flints, and pebbles should be thrown on her.’

There is another guide to the age of the barrows. The Goidelic Celts, who, it will be recollected, were the harbingers of the Bronze period, buried their dead in round barrows. These round barrows are far smaller than the Iberian long ones, and have been subdivided into bell, bowl, and disc-shaped varieties. Dr. Thurnam laid down this useful maxim : Long heads, long barrows ; round heads, round barrows.[3] Expressed less epigrammatically, we say that the non-Aryans interred in the long barrows, the Aryans (Celts) in the round ones. Of course, it has never been pretended that there is any necessary connection between the shape of the skull and that of the barrows ; it is merely a convenient coincidence. Nor must we press the adage too far. It is true for the South of England, but on the Yorkshire wolds Canon Greenwell found dolichocephalic and brachycephalic skulls in the same round barrows. He believes, however, that no primary interment in a long barrow has yielded up a brachycephalic cranium.[4] Where successive burials occurred, resulting in our discovery of long-heads and short-heads in the same grave, we are perhaps justified in supposing that there had been an intermingling or a partnership of races.

The Aryan Celts appear to have been polytheistic. They had deities personifying war, the sea, rivers, fountains, trees, and the heavenly bodies. The idea of a separate caste exercising sacrificial functions was foreign to the Aryans ; normally, the house-father was priest of the clan. But there is always a tendency for higher races to ascribe magical virtues to the lower ones,[5] and hence, wherever Aryans and non-Aryans have come into contact, the former have generally copied the religious system of the latter. The Goidels cheerfully accepted Druidism, thus allowing their slaves and subjects to be their religious teachers or angakoks.[6] There seems to be no proof, however, that the Brythons ever had any Druids.[7]

The Celts are supposed to have been pre-eminently builders of megalithic monuments, commonly at first connected with burial-places, such as we see at Stonehenge, on Dartmoor, and in the Orkneys. Religious observances may have become associated with these monuments later. Professor Francis T. Palgrave, in the Prelude to his 'Visions of England,' thus outlines later Celtic customs in this respect :

> 'Earth huts and rings that dot the chalk downs high,
> Dark rites of hidden faith in grove and moor ;
> Idols of monstrous build ;
> Wheel'd scythes of war ;
> Rock tombs and pillars hoar.'

Unfortunately, our Surrey tract contains no admitted example of cromlech, dolmen, or menhir. The nearest dolmen is that known as Kits Coty House, on the Pilgrims' Way, near Aylesford, North Kent. This monument is composed of blocks of indurated sandstone, provincially called 'grey wethers,' and obtained from the Woolwich and Reading beds or the Bagshot Sands. A similar kind of rock forms a considerable part of Stonehenge. In passing, we may remark that, while Lord Avebury, in the latest edition of 'Pre-historic Times,' considers Stonehenge a monument of the Bronze Age,[8] the excavations conducted in 1901 seemed to indicate that it belongs to the Neolithic period entirely. Stone mauls and stone implements were found, but none of bronze.

We have just said that North-East Surrey possesses no menhir or longstone, but there is a suspicion that the 'King's Stone' at Kingston-on-Thames, and the Coronation Stone in Westminster Abbey, on the Middlesex bank, are parts of menhirs. We shall refer to these relics in another section.

It will already have been gathered that the Iberians practised inhumation. The Goidels at first followed the same custom, but at some unspecified period cremation came into fashion, the ashes being enclosed in cists or urns. For some time the two modes continued side by side, and where an interval elapsed between two interments, a single barrow often exemplifies both methods.

The archæologist has to guard against two main sources of error in examining barrows. The Romans and Saxons sometimes raised barrows over their dead. 'Tumuli' is the word generally applied to such mounds. They are usually small and of little height. Apart from the interpretations of osteology, the articles found in the graves should be decisive as to the period. The other chance of confusion comes from the fact that the Saxons often appropriated Neolithic and Bronze Age barrows for burial purposes. In such a case, the Saxon skeleton lies at full length, and at slight depth. The accompanying objects are so distinctive, that these secondary or tertiary interments should cause little real difficulty.

We will now pass under review such Surrey barrows as are still left, a sad remnant, it will be seen, of what must once have existed on and near the North Downs. Proximity to London has told against the preservation of burial mounds, for the older antiquaries, careless, alas, of the contents of the barrows, unless such contents were large and valuable, had no long journeys to perform on horseback in order to reach exploring grounds. The sequel is a tale of ruin and might-have-beens. The remaining barrows are all round ones; with the exception of one of the Wimbledon group and the probable Bedford Hill specimen, we cannot say how many long ones originally existed.

Commencing near home, there still exists, near Cedars Road, Clapham, what may possibly be a round barrow. It is in the garden of a house opposite St. Saviour's Church, and is visible to anyone passing along the old, narrow passage called Wix's Lane. Mr. J. W. Grover, who brought the matter before the Archæological Association in 1884, had been struck by the discovery that old maps marked the spot 'Mount Nod Fields.' Precisely what bearing this has, viewed from the standpoint of archæology, will be discussed in a succeeding chapter. The mound must originally have been 70 or 80 feet across, but had been tampered with on one side for the construction of an ice-house. Mr. Grover suggested that the mound may be of Celtic date.[9] To us, the height—some 12 feet or more—together with marked signs of reconstruction at a comparatively modern date, indicate the necessity of withholding judgment. The original tumulus may simply have been increased in height, but, remembering the excavations made at 'Boadicea's Tomb,' wariness must be the watchword ; digging alone could settle the question.

A few years ago a supposed barrow was levelled in Bedford Park, Bedford Hill, Tooting, and no record taken of the results. The mound was enclosed in the Park for several centuries, but when the grounds were laid out for building purposes ten or a dozen years since, it suffered rough usage, and was finally destroyed. It was nearly 100 yards long, and about 20 feet in breadth in its highest part. It ran East and West, and had several trees growing on it before its desecration. One of these was 3 feet in diameter near the ground. A moat had been made round the mound for about two-thirds of its circuit. This moat was supplied with water by the Ritherdon, a small stream rising in Streatham. The name is preserved in the adjacent Ritherdon Road. The material of the mound was gravel and gravelly loam, which, in the neighbourhood, occurred only in a thin layer, thus forbidding the conclusion that the structure was merely composed of the soil dug out in making the moat. The excavated material would largely be London Clay.[10] As the genuineness of this barrow was, we believe, called in question after its demolition, when the subject was beyond reconsideration, we mention two shreds of collateral evidence. The ground on which the tumulus stood was about the highest in the district. The name Tooting may also have some bearing, for Mr. Clinch thinks that it was a Celtic settlement where was worshipped the deity known as Taith.[11] (Compare also *toot-hill*, as exemplified in Tot Hill, Headley, Tothill Fields, Westminster, famous for fairs and tournaments, also Tutt Hill, near Thetford.)

Twenty-three barrows once stood near the fire obelisk on Wimbledon Common, that is, on the high ground overlooking Kingston Vale and Roehampton on the one side, and the valley of the Wandle at Wandsworth on the other. They were said to have been opened by Dr. Stukeley about 1760, and part of the materials were used to repair the parish roads.[12] Some remains were, however, traceable in 1833. Stukeley dug open one barrow which was about 5 furlongs from the principal group. He speaks of it as 'a very large barrow of the ancient class,'[13] it was evidently a long specimen. Could this old antiquary but return to his haunts, he would hear unpleasant remarks from the more scientific hill-diggers of to-day.

William Camden, in his 'Britannia,' 1586, says that twenty-five barrows formerly existed at Thunderhill, above the village of Addington. One barrow was nearly 40 feet in diameter, the rest not above half that size. Fragments of urns had been obtained from these barrows.[14] In the same district, Camden speaks of other barrows, many of them tolerably perfect. Camden's information has been copied by historians and compilers of guide-books ever since; Manning and Bray, Allen, Brayley, and even the writer of a standard work published only three or four years ago, all say that at Thunderhill the remains of the barrows are still traceable. This foolish repetition caused us much perplexity, until we found, after much labour, the original author, if, indeed, Camden was the first to publish the statement. A most diligent search on our part has not revealed the site of the barrows. Only one old man knew the name, or, to be quite accurate, a similar name—Thunder Common. The memory of the barrows has utterly perished, yet traditions about Castle Hill, in the same parish, are in the mouths of all the villagers. The six-inch Ordnance Map knows no such place, but an old map by C. and H. Greenwood (1823) marks what may be the site, if 'above the village' and other of Camden's data are followed, as 'Three-halfpenny Hill.' A second visit of inquiry led to nothing, so, for the present, we think that no traces of the barrows exist.

Manning and Bray (1814) mention two small barrows on Godstone Green, and two of considerable size in fields to the North of the same place. Those on the green have now totally disappeared. Of the others, the outline of the more Southerly has been spoilt, through being cut away at the base in the making of a road. The Northerly one, which lies at the back of the sand-pit at the entrance to Godstone village, is in good condition. It is about 22 yards in diameter, and makes an unmistakable feature to the eye of the archæologist. As there is a concavity at the top, this barrow has perhaps been rifled.

The name Barrows Hedges, occurring on the map South of Carshalton, arrested our attention, and a careful inspection of the waste ground there enclosed gave us faint indications of a probable site. Excavations have been made in several places ; the old people say, somewhat vaguely, that these were dug to get flints, ' when they made the roads '—a rather unlikely supposition, since the roads are at some distance, and flints could be had on the surface close at hand. A reference to Camden showed that the name was not misapplied, for he alludes to three barrows at this spot, and adds that the largest was hollow at the top, and had therefore been opened. The smaller ones were called Galley Hills.[15] Gough adds, in a footnote to this paragraph, that Hedges is a term applied to Roman roads, as, for instance, King's Hedges in Cambridgeshire. Now, Mr. H. F. Napper considers that the Roman road to Carshalton ran by Barrows Hedges. It is probable that there was also Roman, and Celtic, communication with Woodcote, so that the barrows were not in a position isolated from the movements of prehistoric life.

About a mile South-West of Banstead Church, in a field close by Tumble Farm, on the outskirts of Nork Park, is an eminence marked on the map as Tumble Beacon. A picturesque clump of pines stands on the mound, which, from its general character, and from the flint scraps we have found there, we have every reason to believe is a round barrow, despite the local tradition that it is a 'sea-mark.' The Scotch pines, in such positions as we find here, may probably, Mr. Grant Allen thought, be the descendants of trees put in by human hands when the barrow was first raised.[16] This barrow is shown in the frontispiece. On Banstead Downs, to the West of the road leading from Sutton Station to Reigate, there were formerly four small round barrows. In 1898, Dr. Arthur M. Thomas reported that one of them had recently been destroyed by the members of a golf club, and that one other appeared to have been opened some time previously. In the partially rased barrow, Dr. Thomas found the greater part of a skeleton, but the skull was missing.[17] Two of the barrows are still (1902) fairly perfect, a third, only discernible in outline, is apparently the one levelled four years before, the last has been much mutilated, to all appearance quite recently. Well might Dr. Thomas deplore such vandalism, and we may also be excused for asking whether nothing can be done to stop it. At the extreme South of the Heath, above the Epsom Downs railway line, another barrow can be made out, and we imagine that there were originally several more.

Before the Society of Antiquaries, in 1860, Sir John Evans described the opening of what had, in his view, been two barrows, on the Lower Greensand, near Redhill Junction. The circular patches representing the ground-plan were not elevated, and were distinguishable only by their greater luxuriance of vegetation. At a depth of 18 inches were found burnt bones, calcined flints, and a corn crusher, relics suggestive of a Celtic burial.[18]

Oliver's Mound, in Richmond Park, was traditionally said to have been occupied as a camp by Cromwell, but as, in 1834, three skeletons were found at a depth of a yard from the surface,[19] it is a fair surmise that a barrow existed there, especially as many old earthworks and mounds are foolishly connected with the name of Cromwell. The mound, which stood in the Sidmouth plantation, exists no longer, its site being occupied by a gravel-pit.

One of the most perfect barrows in our area is situated high on Leatherhead Downs, about half a mile East of Cherkley Court. It has a diameter of 25 feet, and is of the common bowl-shaped variety. It is surrounded by a fence, and, although a rustic seat has been placed on the summit, is probably intact. This barrow is one of four marked on the 1-inch map as 'tumuli,' three to the East of Ermine Street, the other to the West. Vestiges of the most Easterly are still apparent, in a field near a small plantation of pines. Scanning the diggings, the date of which seems uncertain, we picked up some calcined stones and a piece of pottery. The latter was very coarse and friable, and small pieces of flint stood out markedly from the soft matrix. We could not accurately determine the sites of the two intermediate barrows. A little to the South of these mounds, and on the East of Ermine Street, which is thereabout lined with yews, is a well-defined fosse, extending two score yards, with other features which seem to indicate an old camp.

On the South side of Box Hill, overlooking Betchworth Park, we have discovered what we believe to be a mutilated barrow, hitherto unrecorded. It has been badly broken into from the North side, and evidently ransacked.

On Reigate Heath, where, as at Godstone, the outcrop is of Lower Greensand, there are seven pine-crowned barrows, four of which are in a well-preserved state, and the remaining three are easily detected, both by their outline and by the clumps of trees. Guide-books vaguely speak of these mounds as 'Saxon tumuli,' and tell us that when the pines were planted glass beads and ashes were disclosed. Around these barrows we have picked up flint flakes, worked and unworked, a broken oval knife, and calcined stones. These finds, taken in conjunction with the size of the mounds, seem to attest sufficiently the prehistoric character of the barrows, nor would glass beads and ashes preclude the assigning of their age to Celtic times.

In the South-Western corner of Carshalton Park, near the Wallington and Sutton railway, there is a conspicuous mound, marked on the 6-inch map as 'The Mount.' The pile is not recent, as proved by the aged trees springing from it, but there is no direct evidence that it is a grave-hill.

Abundance of worked flints, however, occur in the neighbourhood.

There is a ruined barrow not far from the site of the Roman villa on Walton Heath, to be hereafter described.

'The Mount,' a large circular eminence on the Lower Greensand, near Barrow Green, Oxted, is mentioned by Mr. Malden as a good specimen of a sand barrow.[20] It was, however, opened in 1869, under the superintendence of some members of the Council of the Surrey Archæological Society, and was thought not to be a place of interment.[21] Several trial pits were dug in the circumference, and a deep trench cut through the centre. The sandstone rock, forming the natural soil, was met at a depth of from 3 to 6 feet, and hence the elevation was deemed to be natural. There may still be room for a little doubt. First, the position, 393 feet above sea-level, is a favourable one. The name 'Barrow Green' need not be emphasised; it may be an afterthought. There is a distinct trench around the base, such as might be made in removing soil to form a mound upon an admittedly natural platform. Next, we found, (1902), among the excavated material, several flint flakes, one showing fire-marks, and naturally conclude that the relics were not very carefully collected. The mound is well worthy of a visit. It stands in a park, and is clad with beeches, oaks, and pines. Just below are the oast-house and barns of Barrow Green Farm, and the diversified outlook of meadow, woodland, and hop-field comprises one of the loveliest regions of Surrey.

The whole subject of these prehistoric burial mounds is full of allurement. These primitive tombs are eloquent with the mysterious echoes of bygone people, who, now unnamed and forgotten, once trod the 'long dim aisle of years.' We stop to think of these downland barrows, covering the dust of men who were fashioned like unto ourselves, men whose relics the peasant heedlessly disturbs or casts aside. As we stand there, listening to the faint tinkling of some distant sheep-bell, and trying to appreciate the grey antiquity of the mound, we muse on the evanescence of a single generation, and the unutterable feebleness of the individual man.

An overpowering sense of bewilderment creeps over us, and we fall under an inscrutable spell :

> 'Stars silent rest o'er us,
> Graves under us silent.'

But we must return from dreamland to facts. If we pass just outside our area there are two or three antiquities to be seen. There is a well-preserved barrow on the Greensand in Deerleap Wood, Wotton. It is covered with a dense coating of pine needles. On St. Martha's Hill, Chilworth, are some curious earth circles, and on the chalk Downs, between Effingham and Bookham, are some pits, which we have not visited, but which Mr. Malden conjectures, are collapsed dene-holes.[22] Dene-holes have been variously considered to be places of concealment, storehouses for grain, and excavations of chalk for manure.[23] Into these theories we dare not venture, as, in any view, the pits are doubtfully prehistoric, nor have we any undisputed examples in our little corner. True, Camden (1586) says that on the hill above Coombe hamlet, near Croydon, there were several artificial pits, terminating in a cave ; they may actually have been either dene-holes or cave-shelters.

Saxon burial grounds, which sometimes comprised barrows, have been discovered in several districts, but, as before asserted, there was no real trouble in determining their epoch. There are clear traces on Farthing Down, Coulsdon, of many of the mounds opened thirty years ago by Mr. Flower and other gentlemen. Sixteen graves in all were examined. They were hewn in the chalk to a depth of 3 or 3½ feet, and the hillock was seldom more than 1½ feet above the surface of the down. The objects discovered included silver pins, gold bullæ, an iron knife, a silver bracelet, etc. Some of these articles are to be seen in the museum at the Public Library, Croydon. The explorers think that the cemetery may be assigned, with tolerable certainty, to the Christian or post-Augustine age, soon after the conversion of the Saxons to Christianity.[24] In 1871, Mr. Addy discovered a Saxon burial-ground at Beddington,[25] and isolated interments have been frequently recorded.

CHAPTER VIII.

PREHISTORIC CAMPS OF THE SURREY CORNER.

Despite the natural barrier constituted by the Weald and the woodlands of Southern Surrey, our county was more deeply affected by the Roman occupation than is generally supposed. As we shall shortly claim some of the reputed Roman camps as prehistoric, we will just glance at the list of actual Roman remains to justify this apparent conflict of statements. Surrey is at once more Roman, and less Roman, than it is accounted in popular belief : continuity of site occupancy helps to explain the paradox.

On his way to attack Cassivelaunus, Cæsar would cross the county, perhaps by the Pilgrims' Way. Whether he forded the Thames at Westminster, Lambeth, Battersea, Putney, Kingston, Halliford, or Walton, we leave others to decide, for each place has had its advocates. It is clear, however, that the invaders constructed roads, or adapted the older Celtic trackways to their needs. Ten miles from London was the important station of Noviomagus, supposed, as we have said, to be Woodcote, near Wallington.

Roman villas were dotted here and there ; we proceed to notice some of them. Others will be glanced at in various connections. The remains of the Roman building discovered in Greenwich Park in 1902 need not be dwelt upon, since they are outside Surrey ; a full account was given in the newspapers of February 21 of that year. In 1772 the remains of a villa were uncovered at Walton Heath. They consisted of foundations, flues, pavements, a brass figure of Æsculapius, a Vespasian coin, and fragments of iron, lead, and glass.[1] Other relics were disclosed in 1864. The tradition of the finding of the 'gold image' is still current, and there is an abundance of broken tiles and pottery to be picked up. We once found a whetstone, pieces of concrete, and some tesseræ of burnt tiles, 'whereof,' as Sir Thomas Browne says, 'part remaineth with us.' The diggings must have been carried out in a scandalously lax manner, for we know of one spot where a portion of a pavement of these red tesseræ can still be revealed by uncovering the turf. To have left this little causeway in its original position, and yet to have mined and channelled the ground until the soil and the tiles are everywhere spread higgledy-piggledy, is proof of gross lack of method on the part of the older antiquaries, who sought only the more showy kind of relics.

The outlines of three Roman camps can still be made out on the Heath, not far from Walton mill, to the South of Tadworth. The camps are all rectangular, or, indeed, square in outline. The two close to the mill are the best preserved, the ditches and 'gates' are readily found. The third camp lies about a third of a mile South-West of the windmill, and on the opposite side of the Betchworth road. Here the trenches are not so deep, and at one corner they have been obliterated by the removal of sand and gravel.

Another villa was discovered at Beddington in 1870,[2] and, as bearing on the theory of Roman adoption of British sites, we may mention that, at about the same time, a hoard of bronze implements was brought to light in the immediate neighbourhood. There were thirteen pieces in all, comprising ingots, celts, spear-heads, and a gouge.[3] Again, in 1847, whilst Titsey Park was being drained, Roman walls, a tessellated pavement, keys, knives, nails, and pottery were dug up. The remains were fenced in by the proprietor, and are still (1903) in an excellent state of preservation. The park is five miles from the old Roman road which ran from Sussex to the capital, starting probably at Newhaven.

One's first reflection is, that a better situation would have been found more to the East, say, near Marden Park, whither transit was brief and easy. Mr. Granville Leveson-Gower, in describing the discovery, unconsciously gives us a key to the mystery : there had been previous occupancy, and the Neolithic and later stages merged into each other at Titsey. Among the undoubted Roman relics the writer figures a polished flint celt. We turn, therefore, from the engraving to the narrative, and read, at the conclusion, with satisfaction, but not with surprise, the following note : 'It (the celt) is figured here because it was found close by the villa, in grubbing down an old bank and hedge. Its occurrence there may have been purely accidental, and cannot be made use of to establish a theory ; but, taken in conjunction with the fact that numerous flint flakes, worked bones, and fragments of pottery, probably British, have been found on and close by the site of the Roman villa, it may be considered as one among other evidences of a very early habitation of the spot.'[4] Later, a perforated sandstone hammer was found at the same place ; this would be of the late Neolithic or Bronze period. Roman pottery and kiln refuse have been laid bare at Limpsfield Common, where, once more, we have found Neolithic traces. Near Pendhill House, overlooked by the fort called Cardinal's Cap, the remains of a Roman building and a hypocaust were disclosed in 1813, yet the name Pendhill is supposed to be Celtic. Ashtead Church stands close to a camp, said to be Roman. Most of the trench-work is still visible, and some Roman tiles are built into the walls of the church. We should add that near the rut of the carriage-way, by the South rampart, we found a few flints, including a neat scraper, of crescent shape. This catalogue of Roman antiquities must suffice for the present ; the record of Roman coins is fully treated in the Victoria History of the county.

Roman camps, in the opinion of Dr. Guest, were either temporary resting-places, or mounds for permanent lines of defence. The former were constructed by making a ditch about 5 feet deep, the removed soil being thrown inwards to form a crown or breastwork. This was fortified by valli, or stakes, and hence was called a vallum. The permanent camps, common in the North of England and in Scotland, had the vallum withdrawn several feet from the edge of the ditch.[5] Early Roman camps are commonly rectangular in shape, but later ones are found which do not follow the recognised rules of castrametation, hence it is concluded that the methods of construction were affected by the barbarian workmen. On this ground, most of the camps in the Surrey corner are claimed as Roman, but we submit that some are earlier. And there is this factor common to the work of the two peoples—the round or oval camp of the British and the quadrilateral of the Romans are often modified to fit the contour of a hill, and, if the eminence be steep on any side, there the rampart is generally omitted.

The earthworks of the pre-Roman date, usually assigned to the Bronze period, but in reality frequently earlier, may be divided into camps for living quarters, perhaps seasonal, and forts, or refuge camps. Sometimes, as before mentioned when dealing with Worms Heath, the residential camps have pit dwellings within the actual confines. Of the hill-forts in North-East Surrey, we reckon two: Cardinal's Cap, Caterham, and Cæsar's Camp, Wimbledon.

Cardinal's Cap stands near White Hill, at a height of about 750 feet above the sea-level. Though actually in the parish of Bletchingley, it is perhaps more easily reached from Caterham, which lies below it about two miles away. The fort is so named in Manning and Bray's 'History,' though the designation seems to be of late date, and exists only in the nomenclature of the archæologist. When we first tried to find the fortress, an aged peasant directed us to 'the old battle-ground,' which seemed to be in some undefined position between Willey's Farm and Chaldon. A second day was set aside for the quest, and, by the aid of the 6-inch map and repeated inquiries as to 'the place where the battle was fought,' we succeeded in finding the spot. The fort formerly abutted on War Coppice, and is in private grounds.

The name War Coppice is believed to have been kept alive by antiquaries, though it was known to Aubrey, and the country people have retained it to some extent. Mr. J. Wickham Flower, who described the camp about thirty years ago,[6] thought that the name was an abbreviation of Warwick Coppice, and instanced the adjacent Warwick Wold Down and Farm. Little of the actual earthwork is to be seen now. A part of the trench behind the coach-house of the mansion, filled up in one place to permit a roadway to cross it, with vague traces of trench and vallum on the return curve, across the grounds, are only discernible. A continuation of the fosse may be made out on the wooded margins of the adjoining ploughed fields West of the house, and close to the old Pilgrims' Way. We take Mr. Flower's measurements. At the time of his visit, the ramparts formed—and the present remains so far testify to the truth of the observation—the segment of a circle or ellipse. Even at that time the outlines had been defaced by chalk-quarrying and agricultural work, but the camp was computed to have occupied originally 20 to 25 acres. Evidently mutilation has gone on apace, for Mr. Flower describes the double vallum, an inner rampart 12 to 15 feet above the fosse, which was 6 to 8 feet wide, and an outer rampart of 6 to 8 feet in height. To-day, were it not for guide-books, with their thrice-copied information, together with the occasional visits of antiquaries, the very memory of the fort might fade away. Yet its situation is magnificent, and must once have rendered it a secure refuge. To the North, the fort looks down upon Aldercoombe and the Harestone Valley as they dip gently towards Caterham. Far below, on the South, is the flat Holmesdale Valley, worn mainly out of the Gault Clay, and lined with green pastures dotted with sturdy oaks. Beyond this is the counterscarp of the Lower Greensand, covered with pine and fir. Still further away, the Kentish Weald and the Forest Ridge are visible, whilst, in clear weather, the South Downs can just be made out on the sky-line. It is even said that from the top of the tower belonging to Arthur's Seat, two furlongs distant, the observer may sometimes see Shoreham Gap. One of Camden's translators quaintly renders the passage referring to the Holmesdale Valley: (It) 'runneth down very pleasant to behold, by reason of the delectable variety of Groves, and Fields, and Meadows. On each side there be prety Hills rising up a great way above the country; Parkes everywhere replenished with Deere; Rivers also full of fish.'

The shape, size, altitude, and position near the Pilgrims' Way (see Chapter IX.) were considered by Mr. Flower to tell against a Roman origin of the camp, and in favour of a British one. We quite accept this conclusion, though so far we know of no records of the discovery of either Roman or pre-Roman objects. On the sister height of Gravelly Hill, two or three hundred yards away, we have picked up several flint flakes, one having a double bulb and secondary workings, or 'retouches.' This hill also appears to show slight signs of early defences. Cardinal's Cap was, in all probability, a refuge camp for men and their domestic animals at periods when warfare waxed hot, and when an impregnable position was of prime importance. Here we may mention that the South side of Box Hill shows traces similar to those of Gravelly Hill, and may likewise have been fortified. On this classic spot, Mr. Grant Allen picked up Neolithic implements, and, though unpromising at first sight, when the turf was pared away two years ago for more modern defences, we discovered flakes, cores, and a roughly-worked scraper.

As most nearly resembling the fortress at Cardinal's Cap, we select Cæsar's Camp at Wimbledon. The name is a modern growth; alternative, and earlier, names are Bensbury Camp and 'The Rounds.' This circular camp is to be seen on the South-West of Wimbledon Common. Its elevation is about 200 feet. The position of Woodcote can be discerned on the South-West, and the Downs of Epsom and Banstead on the South. On a clear day, the modern observer may easily see the Grand Stand on the Epsom race-course. Traces of the old entrenchments can still be made out, but the immense dyke which existed on the East is now filled up. In fact, the camp has had many vicissitudes, for in 1871 it was let for building purposes. The old scrubby oaks near the entrenchment were felled, and materials were carted for work to be commenced. Happily, operations were stopped by a legal decision, and, although a heap of rubbish remains as an unseemly memorial, the public can still pass through the camp, and picture its former importance. This is all the rambler can now accomplish, for the footpath was fenced in by barbed wire during 1902-1903.

It is estimated that the Bensbury Camp originally occupied 14 acres. On three sides, looking towards the county generally, the ascent to Bensbury is somewhat steep, on what may be termed the London side there was a tract of thicket and swamp. To this day parts of the adjoining heath are so marshy that the incautious wanderer may occasionally find himself sinking into a foot or two of bog and oozy mud. Bensbury doubtless got the popular name of Cæsar's Camp from the received opinion that it was of Roman date. Some writers have deemed it of still later origin. Mr. Ralph Nevill, after reviewing the evidence, thinks that it was constructed after the Roman departure, most likely by the independent Romano-British States as a bulwark against their neighbours of Wessex.[7] Replying to those who fixed the date later than this, Sir James Ramsay pointed out that it could not be Danish or Saxon, as it did not contain a mound. We know that there was a Roman camp across the Beverley Vale, in Coombe Wood, and that Roman remains have been discovered at Kingston. Dr. Salmon, referring to Bensbury, sagely remarked that he could not 'satisfy himself of its Romanity.'[8] We believe that the features all confirm the conclusion that Bensbury is of Neolithic age, though it may be late in that period, and subsequent to the work at Cardinal's Cap. It has been urged that, if the camp had been constructed at either of the two first invasions, it would have been of the orthodox rectangular shape, instead of circular; against this, it is said that in later periods the Romans often copied the fashions of their barbarian auxiliaries. The objection as to water-supply, a matter about which the Romans were particular, is easily met, since, on the heathy plateau, a little towards the North, is a clear spring, now ringed by a cluster of Scotch pines. The spring has been nicknamed, rather foolishly, Cæsar's Well, but its antiquity is perhaps even greater than the inroads of that general, and it may have provided water for the Bensbury Camp.

It has been the custom to refer huge earthwork camps and forts to the Bronze Age; we prefer to follow the exhaustive analogies of Mr. Gomme, wherein he gives good reason for supposing that the builders were the non-Aryan Iberians. On this supposition, the forts formed part of an elaborate system of defence when clan was pitted against clan.[9] Our list of flint implements found in and near the camp, and dealt with in some detail in Chapter XIII., supports the idea that the Romans had been forestalled in the selection of the site. Now, there is good proof that many earth-forts, such as Old Sarum, in Wilts, and Maiden Castle, in Dorset, were successively British, Roman, and Saxon, and it may well be that Bensbury was tenanted in order by Iberian, Goidel, Brython, Roman, Saxon, and Dane; nay, the question springs to the lips, 'What could be more natural?'

Outside our North-Eastern area there are other earthworks of a character similar to that of Bensbury and Cardinal's Cap. Anstie, or Hanstie Bury Camp is a hill-fort on the extreme edge of the Lower Greensand escarpment, 4 miles from Dorking. It is on a hill 775 feet high, which commands the Wealden valley. It is elliptical or nearly circular in shape, and covers about 11 acres. Except on the Southern face, where the hill is precipitous, there is a double trench. When the vallum was protected by its palisade of heavy stakes, the fort would be a formidable position to attack. As at Wimbledon, Neolithic relics have been recorded. In 1763, whilst digging outside the trenches, 'considerable numbers of neatly-made heart-shaped flint arrow-heads were met with,' a significant hoard of treasure, considering the scarcity of arrow-tips in Surrey. The chronicler pertinently adds that the diggers found 'no coins, nor any implements of bronze or iron.'[10] The large fort or camp on St. George's Hill, between Cobham and Weybridge, has an irregular shape, but it is very difficult to trace accurately, and, owing to the dense matting of pine needles, few relics can be expected to meet the eye of the searcher. We have, however, collected a few flakes there.

We return to our own area, and take the remaining camps in the order by which they seem to form a series ranging from the hill-forts described to the camps admittedly Roman. Three-quarters of a mile to the South-East of Godstone Church, and near Leigh Court, is a well-preserved earthwork, known as Castle Hill. It is a height, natural in its primary features, and roughly circular in form, the diameter being about 70 yards. At the Eastern sweep, artificial work can be well seen in ditch and rampart. On the North-West there is an abrupt slope, having at its base the two lakelets, Mill Pond and Leigh Place Pond, the haunt of coot and moorhen. Here also is a charming nook, in which stands Godstone mill. The mill is turned by water brought thither by the boulder-strewn Stratton or Gibbs's Brook, and the whole of the scenery might well have been transferred from a corner of Derbyshire. The earthwork itself is planted with birches, larches, firs, and pines; foxgloves give an under mass of fine colour in summer, and in the ravine are the greenest of ferns. This camp seems plainly to be pre-Roman, and in the hop-fields hard by we have picked up Neolithic implements.

Brayley speaks of an 'eminence' called Castle Hill, in the fields near Chessington, and says that Roman coins were once found there.[11] As the 'eminence' appears never to have been described, we give a short account of it. In the first place, the name Castle Hill, so frequently applied to these earthworks, seems to be unknown in Chessington, but the plantation in which it is situated is called 'Four Acre Wood,' a misnomer, however, unless we interpret it as 'The Wood in the Four Acre Field.' The camp is roughly elliptical, with one end slightly narrower than the other. We first explored the camp one bright, cold day in January. At our approach, nine jays flew out of the wood in quick succession, their loud alarm of *rark*, *rark*, disturbing all other creatures within hearing. We found the difficulty of examination very great, owing to the thick tangle of whitethorn, hazel, and wild rose. As we struggled through this underbrush, severe scratches were received, and the dimensions, as paced out, must be regarded as approximate only. The length was found to be 100 yards, the breadth 30 yards, and the depth of the fosse 4 yards. Neither cold nor scratches could remove the pleasure of tracing the old camp, and, the cry of the jays having ceased, a greenfinch sat calmly on the boughs in the bright sunshine, and a bullfinch uttered his gentle call *tiu*, *tiu*, a sound dear to the naturalist. Of the age of the camp we could get no clear indications. The work is such as would be usually termed Roman, but it is probably earlier. There is a supply of water close at hand, for the camp is skirted on the North-West by a brook which, tracked by the visitor, takes him unexpectedly into a charming little glen cut out of the stiff clay. Such a dell is a somewhat rare feature in similar formations, but the chalk outcrop is only a bowshot or two distant. The little stream is a tributary of the Hoggsmill ; it crosses the Ewell-Hook road, forming a ford or ' water-splash ' at Bones Gate, and joins the main waters below Old Malden. Between the outer rampart and the stream is a belt of alluvium about 50 yards wide, and the field on the opposite side rises steeply from the now feeble watercourse. Altogether, this old earthwork was a pleasant contradiction of guide-book archæology. When we remember that the primitive folk of Britain were adepts at wattling, we can imagine what an admirable fold this camp would form. A mound carefully hurdled, moderately elevated by nature and art, blessed with abundance of running water—one cannot but think that, night by night, the rude forefathers of Cisendon (Chessington) drove their cattle and sheep into this enclosure, and carefully replaced the last length of basket-work. Once inside, the flocks and herds were safe from runagate dogs and starving wolves. Some portion of the shepherd community, we may suppose, if not the whole of the inhabitants, would at times sleep within the camp, instead of on the Downs half a mile away, though this earthwork would be for use in times of peace, and not for refuge, like Cardinal's Cap or Bensbury. The camp and the green pastures speak clearly of a pastoral people. That military folk, like the Romans, saw the spot, seized it, and diverted it from its first purpose, one would not care to deny.

Mr. Malden, in an article on the ' Early Camps of Surrey,' refers to a small rectangular Roman camp near the Mole above Stoke D'Abernon,[12] which he considers was intended to shelter a small detachment. The camp, though not far from the boundary-line of Leatherhead and Stoke D'Abernon, is actually in the latter parish. It is situated in a wood of oak and fir a little East of Pachesham Farm. The Ordnance map gives an elevation of 172 feet in the near neighbourhood. On close examination, the fosse, which is about 12 feet deep, proves to be elliptical. The South-Eastern edge is bounded by the Rye, a small, alder-fringed stream, which rises on Epsom Common, sluggishly ploughs its course through the London Clay, and enters the Mole a little below the camp. By the wood, it widens into a bird-haunted mere. During a recent visit, in spite of the carpet of leaves, we contrived to pick up a number of pot-boilers or calcined stones, so that it is possible that Aryan herdsmen constructed their wattled cotes around this oval space, lolled on its sunny banks whilst polishing their hatchets or tomahawks, or set their meal to cook whilst they sheared the sheep of the pastures of the Mole. In any case, we prefer to look upon the ' Romanity ' of the camp as at present non-proven.

A more plausible claimant for Roman origin is the camp in Ashtead Woods, again a construction on a London Clay site, though at an altitude of 269 feet. Brayley estimated the area of this camp as between 2 and 3 acres, and said that so far as he could ascertain, its shape approached 'an oblong with rounded ends,'[13] an observation which our inspection tends to corroborate. But, just as Brayley found that, half a century ago, the close growth of oaks and underwood made exploration arduous, so will the pilgrim find the conditions to-day. Yet we have discovered there abundant fragments of earthenware, some of so coarse a character as to suggest a pre-Roman date; there are also numerous calcined flints; and some flint flakes—rare objects on a stiff clay soil.

There are traces of prehistoric earthworks visible in the fields to the South of Addington Church, and we have noticed other signs near Castle Hill Farm, three-quarters of a mile further South, hence there was probably an early 'location' here. There is also a camp, nameless, and, we believe, hitherto unrecorded in any work on archæology, not marked, moreover, on the 6-inch map, in Henley Wood, in the parish of Chelsham, about a quarter of a mile South of the pond on Chelsham Common (see map). To this camp we have alluded previously, when referring to the settlement of pit dwellings on Worms Heath. There is good excuse for the investigator who has let the camp escape his eye, for no sign is apparent from the outside of the spinny which contains it. Our attention was called to the spot by a story of a well in this wood, popularly reputed by the peasantry to be of great depth, and to have gold at the bottom. 'But it is blocked up with faggots,' said a villager, 'and they (persons unknown) won't let anyone dig for it.' The well was found to be about 8 yards within the Southern rampart of a rectangular camp, which occupies more than half the area of the wood (see map). The diameter of the well, at the top, was some 5 feet; at a depth of 15 feet it seemed to be blocked up with hurdles. Probably this filling up was carried out after 'a poor hound fell in and was killed,' as an aged inhabitant told us. A short distance East is a circular depression, very boggy, representing, it would seem, an old pond. Forty or fifty paces away is another pit, oval in form, and quite dry; it is immediately outside the Southern rampart. The bank by the Eastern boundary hedge is fairly well marked; on the North it is very distinct, and has a bulge inwards where a path has been made through the copse. At the North-West angle two mounds and ditches are clearly traceable, as also at the South-West; whilst along the Western side we found three well-defined ramparts and ditches. The outlines are difficult to trace, for the plantation is so thickly studded with young hazels and ashes, with an interlacing of particularly prickly hawthorns, that none but the enthusiast would care to drag himself, yard by yard, through this interesting territory. On our last visit, too, we were disappointed by finding the footpath through the copse—apparently never a right of way—stopped up, and threatening notices posted here and there. The appearance of the camp lends support to a belief that it is not earlier than Roman date, especially if the deep well be coeval with the entrenchments. In any case, we should not venture to place it earlier than the close of the Neolithic Age, but the remarks in Chapter IV. about extra-mural dwellings should be borne in mind. It is just possible that the camp may have been a place of refuge or cattle pound, for use in troublous periods, and that it may have been connected with the community on Worms Heath. The country people say that 'there was once a town in the wood.' With others, the town becomes a 'castle.' How strange is the vitality of tradition, kept up by hearsay only in this instance, with no aid from map or local literature!

Having insisted so often that some of the earthworks styled Roman may have had a prior existence, this seems to be a good place to introduce a cognate matter. There was a kind of harrow, called a tribulum, of which a description has been handed down by Varro, in use among Roman husbandmen. An illustration of an implement from Aleppo supposed to be of a similar sort, is given by Sir John Evans in his work on Stone Implements.[14] The teeth of the tribulum consisted of some hundreds of flint flakes, and it has been hinted that many of the multitudinous chips may, in some districts, be due to the use of this implement during the Roman occupation. À *priori*, this seems reasonable, and would only call forth the rejoinder that the Neolithic stage lasted a long time in important, everyday, occupations, not merely in ceremonial matters, nor among rude peasants and serfs, hence flakes would of necessity be abundant. All the same, proof that the tribulum was used in Britain must be demanded, and produced, if the theory is to be accepted. The question is, in the first place, Did the native communities borrow Roman implements or continue to use their own? Mr. Gomme, apparently differing a little from Dr. Seebohm, thinks that 'the influence of the Roman civilisation upon this section of our institutions was not very deep.'[15] More satisfactory, perhaps, is the practical certainty that flakes for the tribulum would not possess fine secondary workings on their edges, as we find in such places as Woodcote, presumably a site adapted by the Romans. Where flakes occur in huge quantities, as at Brandon, Grimes Graves, or Cissbury, there is, in each case, a perfectly independent reason to give. In districts like Woodcote, while we cannot absolutely affirm that the tribulum was not in use, we can say, with confidence, that such and such flakes were not among its component parts, and we may justly ask, Where, then, are the teeth of these old harrows? Another moot question is whether certain well worked flakes were intended for saws or for sickle teeth; the reader will find the matter fully discussed in Dr. Robert Munro's 'Prehistoric Problems.'[16] Since flakes for both purposes were required in Neolithic times, their antiquity seems scarcely placed in doubt.

CHAPTER IX.

THE PREHISTORIC TRACKWAYS OF NORTH-EAST SURREY.

THE study of Roman roads has been much developed of late years, with the result that our knowledge of the construction and distribution of these perdurable monuments has been vastly increased. As we ponder over these magnificent feats of skill, these highways which bound together plain and hill, and linked villa and grange with city and seaport, we are at a loss to conceive what must have been the state of communication in Britain previous to the arrival of the Roman eagles. Yet these very Roman roads are to be our trusty guides. For, it has been shown that, in many instances, the Romans merely straightened and improved the old Celtic and Neolithic trackways. The improvements were, indeed, often of such an elaborate character that the older path has entirely disappeared. In a few cases, the track and the road run closely together.

That the straightening process was very necessary is obvious when we examine the still existing trackways. Occasionally these run tolerably direct, owing to convenient natural formations of the surface ; examples are exhibited in the numerous ' Ridgeways,' as those of Dorsetshire and South Pembroke. The late Professor Henry Drummond noticed that the African savage of to-day will walk round a fallen tree, even after it has been scooped hollow by ants, and is as brittle as matchwood, rather than step over it. So our prehistoric fathers, who spent such incalculable labour on fort and barrow and earthwork, marched from post to post by the most devious paths. This seeming inconsistency may be assigned partly to force of habit, but more to the suitability of the surface of the country, and to the desire for safety from foes, human or animal. Pathways, again, may have frequently been started, in districts of scrub and jungle, by the tracks of wild beasts. Such tracks, at first mere passages through the undergrowth of brier, thorn, and gorse, were widened by degrees, and, once well cleared and trodden, were strictly followed. At times the path turned aside to avoid a barrow or sacred grove, as may still be seen on studying the modern road. The sudden bends and curves of our present roads require, indeed, a knowledge of old tracks for their elucidation.

Premising that the Roman roads, where not manifestly original works of engineering, widely measured and conveniently straight, with layers of earth, lime, sand, chalk, pebbles and mortar—premising that these were frequently suggested by earlier trackways, we will epitomise what appears to be known of the Roman roads of Surrey.

There was first a road or 'mile-path,' which, starting at or near Newhaven, in Sussex, entered Surrey at the Southern extremity of the long narrow parish of Godstone. It passed through Lower Godstone, which still retains the name of Stratton or Stretton (*strata*). From Godstone village it ascended White Hill, in the parish of Bletchingley,[1] either by the main road or by a track to the West of Godstone Green. In the former case, the way turned along the ridge by the firestone quarries, pursuing an older track ; in the alternative, there would almost certainly be an earlier route marked out. From White Hill the road has been traced to Stanstead Heath (a likely corruption of Stane Street Heath), in Caterham, and thence through Chaldon to Noviomagus —Roman station and Neolithic settlement. Here, or at the village of Wallington below, there would be a junction with what is supposed to be Ermine or Ermyn Street. It is a telling piece of evidence that, before consulting authorities as to this particular route, we had independently inferred the existence of such a track from a consideration of the distribution of flint implements at various spots. For the same reason, we venture to insert the Western side of Coulsdon and the height called Farthing Down as intermediate stations between Chaldon and Woodcote. After crossing Ermine Street at Wallington, we think that the Roman road was continued to Mitcham, Merton, and Wimbledon, thence along the Ridgeway—the name is still in use—and by Coombe Hill to Kingston. A short branch would be thrown off to reach Bensbury Camp on Wimbledon Common.

A second Roman thoroughfare enters Surrey at Rowhook and runs below Anstiebury Camp to Dorking.[2] This is the road christened, in this section, by the Ordnance surveyors, Stane Street. From Dorking it is supposed to run by the foot of Box Hill and over Mickleham and Leatherhead Downs. Here it partakes of the nature of a raised, grass-covered causeway, with few interrruptions, but afterwards it unites with an old British trackway, and is lost for some distance.[3] It nevertheless probably passed to the West of Nower Wood, Headley, and then ran straight for some distance beyond Thirty Acres Barn. It is called Ermyn Street on the Ordnance Map for this portion of its course. We should then outline the route to Epsom Downs, Barrows Hedges, Carshalton, Wallington, Croydon, Streatham (*strata*), Newington, and Southwark. Mr. Napper thinks that the British trackway which this road superseded left Leatherhead Downs and went to Carshalton over Banstead Downs; the situation of the barrows which we have marked lends some support to this theory. We would also suggest branch connections leading to Headley and to the camps at Walton Heath. From Barrows Hedges there was, in all probability, another offshoot to Woodcote. Its apparent course is marked by a moderately high chalk ridge rising into hummocks in two places. The first or Westerly mound is dotted with trees, the Easterly one is covered with coppice. Still further East, and near to Woodcote Lodge, the pastures show signs suggestive of the outlines of a Roman villa, but we can get no positive evidence as to this matter. Concerning the terminations of the roads in the capital there is little to say. Sir W. Besant affirmed that there is not in the whole of London a single trace of Roman streets, if we except the bit still called after the name given by the Saxons to the Roman road.[4] On this point, however, the reader might consult Mr. W. R. Lethaby's 'London before the Conquest.'[5] He cites the High Street from Aldersgate to Islington, for instance, as a Roman local way.

Mr. Napper details a third Roman route from London to Ewhurst, Hants, which village he identifies with Ventæ Belgarum. The way was by the Hog's Back to Guildford, thence through the Horsleys, Effingham, Fetcham, Ashtead, Epsom, Ewell, Morden, to Streatham, where there appears to have been a meeting of ways for Kent, Sussex, and Hants.

The trackway now demanding our attention was essentially prehistoric; the Romans may have made use of it, but did not reconstruct it. We allude to the well-known Pilgrims' Way, famous, since mediæval times, as the path pursued by visitors from Winchester and the West of England in general to Canterbury. We say famous as a pilgrim track, for indeed, some writers have superficially considered that purpose an adequate cause for its first appearance on the landscape. Much has been written regarding this old pathway, with its fastnesses and open downs, its old-world hamlets, weathered churches, thatched cottages, fat farmyards, and 'little lines of sportive wood run wild.'

The Pilgrims' Way cuts into Surrey at Farnham, and runs along the Hog's Back to Guildford. Thence it goes over Merrow Downs to Burford Bridge, where there would be formerly a ferry. Mr. Malden believes that track forked at Whiteway End, near Farnham, and that the second branch went by the Southern and lower slope of the Hog's Back to a ferry at Guildford; then it proceeded by the villages of Albury and Shere, and rejoined the first or upper road at Dorking.[6] The lower road, going, as it does, from church to church, appears to have been used by the pilgrims; the upper or prehistoric road keeps well to the North of those villages, though not always on the highest ridges. A tribesman on a down top would be outlined against the sky, and might easily be detected by a foe. A little below the crest, there would be not only a screen from the enemy, but partial shelter from wind and storm. The united track having been taken up on the right bank of the Mole at Burford Bridge, sloped up the front of Box Hill, passed North of Betchworth and Reigate, thence through Gatton Park to Merstham, in which locality it is well defined. There seems to be good reason for the opinion, held by some, that, West of Gatton, the Pilgrims' Way cannot be properly traced, as beyond that village it is rather a complex series of paths. Eastwards, it is different. The road ran along the chalk escarpment, and touched the earth-fort at Cardinal's Cap, near which place it crossed the Godstone-Woodcote road—*i.e.*, Stane Street. Here the track commanded two extensive valleys. It descended to the Caterham road by the Godstone quarries in the Upper Greensand, well to the North of the latter village. It next ascended the slopes across the valley, where it is marked on the six-inch map as passing above Palmer's Wood —a name suggestive of pilgrims—a little to the North of Rook's Nest Park. Here, in 1890, when water-pipes were being laid, a section of the paved road was cut through.[7] The Way then passes South of Woldingham, then between the villages of Titsey and Tatsfield, and so by Cold Harbour Green into Kent.[8] At Limpsfield Lodge, the mediæval boundary hedges existed near the farm road until 1875.[9] In Titsey Park the course is marked by a double line of fine hawthorn and ash trees, and it is said by workmen that, under the turf, the original flint pavement is met with.[10] Near Tatsfield a farmstead still preserves the old name of Pilgrims' Lodge.

The reason for thinking that the Pilgrims' Way was an old British track has already been implied: it ran near the verge of Anderida, where the belt of clay and forest were formidable obstacles. Between Anderida and the chalk range was the Greensand ridge, but here the transverse ravines impeded the cross-country traveller. Like other British roads, the Pilgrims' Way keeps to the elastic turf of the shoulders of the hills. Speaking of what he considers to be the Pilgrims' Way proper, Mr. Malden remarks that the grassy track consistently neglects later towns and villages, which it does not connect, except at its extremities—Dover and Canterbury at one end, Winchester and some seaport on Southampton Water at the other—places which were important before the Roman Conquest. This fact will account for the mediæval variations of the road, which were intended to connect church and church.

To prove the great antiquity of the Pilgrims' Way, Mr. Frank Lasham enumerates the remains which have been found on or near the track.[11] Arrow-heads, celts, and pottery have been dug up in various parts. At Crooksbury, a hoard of bronze celts was discovered. On St. Martha's Hill, Chilworth, are the earth-rings previously mentioned. On Farley Heath there was a Romano-British camp. In Deerleap Wood, Wotton, is a greensand barrow. A British camp at Oldbury (Kent), Roman relics at Walton Heath, the fort at White Hill, the historic and prehistoric remains at Titsey, by no means exhaust the list. A few years ago, portions of an urn and several worked flints were found in a knoll in the garden of Merstham Rectory, west of the church, and hard by the Pilgrims' Way. The Rector of Merstham, the Rev. R. I. Woodhouse, who has kindly allowed us to inspect such scraps of earthenware as he still retains, mentions another interesting fact. In the Church Meadow, below the church, some old iron swords were found by workmen who were planting trees. Two miles west of Canterbury the Way passed through an earthwork, near which tools of iron and bronze, together with pottery, have been found.[12]

Mr. Grant Allen claimed that the Pilgrims' Way was the track along which tin was anciently transported from Cornwall to the port of Sandwich, which is at the Southern extremity of the Isle of Thanet. and stands, or rather did stand, at the mouth of the Kentish Stour. Mr. Allen therefore proposed to call the path the 'Tin Way.' The ingots and hoards of bronze unearthed at different spots are compared with the contents of caches, deposited by Indian tribes when suddenly alarmed by an enemy. Mr. Charles Elton was claimed as a supporter of this theory.[13] But a letter from Mr. Elton, reproduced in 'Three Surrey Churches,' scarcely seems to bear this interpretation, nor do the passages quoted from his book,[14] so that the matter must be considered unsettled. The contention seems to rest on an assertion of Pytheas, to the effect that tin was stored at an island, called Mictis or Ictis, supposed to have lain a six days' voyage from the mineral district. Assuming that this island was Thanet, and Sandwich the port of shipment, the Pilgrims' Way would have its chance among other routes to the port where old-time traders met :

> 'Changing for amber-knobs their Eastern ware,
> Or tin-sand silvery fair,'
> To temper brazen swords, or rim the shields
> Of heroes.'

An interesting by-problem has been raised with regard to the so-called Roman or apple snail (*Helix pomatia*), which is found in fair abundance at Box Hill, Reigate, Merstham, Caterham, and along the line of the Pilgrims' Way generally. Much discussion has been waged as to the antiquity of the apple snail. Mr. Lovell Reeve speaks of its importation from Italy and elsewhere, either as a delicacy or as a cure for consumption. Two periods are assigned, one in the middle of the sixteenth century, the other about the year 1820. The snail was well known to Lister, who wrote in 1628. As it is an abundant species in the North of France, the hypothesis has been put forward that it was introduced by Norman pilgrims to Canterbury.[15] Some conchological authorities, like Mr. Gwyn Jeffreys, have contended that the snail is indigenous,[16] and it has recently been definitely stated that it has been found in deposits of pre-Roman age near Reigate. The result is, that we must frankly put aside *Helix pomatia* as a witness whose evidence bears on the origin of the old trackway.

A more trustworthy set of witnesses now come up for examination, in the form of the sombre yews which here and there mark the line of the Pilgrims' Way. Mrs. Henry Ady, it is true, in her book on the old trackway, states that she does not consider that the presence of the yews is due to design; she thinks that they have been, for the most part, sown by birds.[18] Nor does she give any hint that the old road has a history anterior to the days of mediæval wayfarers. General opinion, however, is in favour of design, whether of symbolical purport, or for the more prosaic use as landmarks, does not much matter. Some of the existing 'baleful yews' probably date back to the times of pilgrimages, and were most likely the representatives of others planted in the British period. Professor G. S. Boulger says that the tree was undoubtedly far more common in Britain formerly than at present.[19] It is not necessary, particularly in view of modern estimates, to assign fabulous antiquity to the yews actually existing, although one or two British specimens may possibly be coeval with the Christian era. The yew grove close to Newland's Corner, near Albury, is frequently said to be mentioned in Domesday Book, but we have been unable to trace the reference.[20] Remembering the principle of continuity, which teaches us to look for the roots of customs in a long-distant past, it is sufficient at present to say that as the yew may fairly claim to be indigenous, it was freely planted along the ancient trackway.

The yew is found in prehistoric peat-bogs in Cumberland and Scotland, and in submerged 'moor-logs' at the mouth of the Thames. We can go a stage further, for yews have been discovered submerged in an early Pleistocene deposit off the coast of Suffolk, within the present area of the North Sea.[21] Moreover, when we see the yew in such lofty positions as those referred to by Professor Boulger—Cranbourne Chase, at the summit of the Hampshire Downs, and on the basaltic eminence of Arely, Staffordshire[22]—there is a fair bias as to intentional planting. Neither does symbolism grow in a day, so that traditions concerning the yew—and they are many and interesting—may well have some basis in the ideas of the people of the Newer Stone Age. Where, in Surrey, primitive paths and earthworks are found, the yew is generally not far distant. Parts of Ermine Street are well supplied with yews. On the Downs at Coulsdon and Leatherhead they are very abundant. A line of these trees marks an old path South of Worms Heath, another track is similarly defined near Addington. The subject of yews will be further discussed in Chapter XI.

Besides the roads already indicated, we venture to give another, whose outlines we base, first, upon the distribution of Neolithic remains, and secondly, upon the existence of parts of old pathways such as those previously described. This road would start somewhere near the junction of trackways at Cardinal's Cap, and run successively over Tillingdown, Upper Caterham, Riddlesdown, and Selsdon, thence to Croydon, where it would join the road spoken of as Ermine Street. We might call this path on the heights 'the Road of the *dons*' (Celtic *dun*).

To summarise matters: we must get behind the labours of the Roman engineers and see what foundations they had to work upon. We must imagine tortuous paths, encroached upon in places by a tangle of undergrowth. Along these routes, the Neolithic people passed from station to station, driving before them their flocks and herds, or carrying home the produce of the chase. Later, we see these tracks improved and widened to accommodate rough sledges and war chariots, and next we may picture a procession of pack-horses and heavy carts bringing provisions to the outlying villas and to Roman London. Once again, when, after the departure of the Romans, the capital was left to its own resources, we can, in fancy, see the Teutonic hordes taking possession of these roads, and, by cutting off supplies, hastening the downfall of the great city.

CHAPTER X.

CONNECTING-LINKS WITH NEOLITHIC SURREY.

In such a science as archæology, many of the conclusions arrived at are the result of reasonable conjecture, based upon faint and trivial, but at the same time, converging lines of evidence. Nowhere else is seen more clearly the truth of Bishop Butler's maxim, ' Probability is the very guide of life.' Hence, in dealing with the clues shortly to be indicated, we are warned not to handle them too firmly, nor to be too certain that the secret of the labyrinth is revealed.

Ethnological clues come first. Here. apart from the customary difficulties caused by the blending of the great races, there is an almost hopeless complexity arising from the cosmopolitanism of London being projected into suburban Surrey. Not until we reach the line of villages stretching across our nook from East to West, from Limpsfield and Woldingham to Bletchingley, Nutfield, Chaldon, and Merstham, and so on to Redhill, do we begin to notice pronounced provincial characteristics. Thence, Southwards, we get a glimpse of rural England little tinctured by the influences of the capital. Broad speech, old-world dress, primitive methods of agriculture, speak of the obduracy of custom. South of the Downs the familiar names of yeomen and husbandmen can be traced back in old leases and ' terriers,' *i.e.*, manorial registers, until Domesday Book is reached,[1] and, speculatively, we are compelled to carry back still further this connection between the soil and its tillers.

In the Holmesdale valley, conservatism of type is only a little less marked than in the Weald. There is a saying, at least as old as the time of Camden—

> 'The vale of Holmesdale,
> Never wonne, ne never shall'—

which alludes plainly to the sturdy, unconquerable nature of the rugged dwellers of that district. What most strikes one is that the Celtic type of feature seems to prevail there. The North Down Iberians were, as a body, perhaps earlier driven to the West than was the case elsewhere, for the entry of races to Britain would be mainly by the South and South-East, and the tide was ever Westwards. The Downs are now peopled by folk intermingled beyond discrimination. On and near the Greensand Heights, where there were no good trackways, the result may have been different. Mr. Malden affirms that, 'Even now in the villages of the Weald, the curious observer may trace the features of a small-boned, dark race, unlike the majority of their neighbours, but like the flint-workers of Brandon in Suffolk.'[2] Dr. Beddoe, a high authority, says that the people of Andred's Wald (Anderida), 'into which Ella drove the natives,' have the British—the word is evidently used in its wider sense—characteristics of dark hair and eyes, whilst the rest of the contiguous district of Sussex is Saxon.[3] Briefly, the country from the Downs to the Weald may be compared to the backwater of a stream whose course ran West.

We incline to the opinion that the Teutonic invasion did not influence Surrey to the same degree as it affected Kent or Sussex. The forest area could only be flanked, and the first-comers would therefore be hard to dislodge. Even when permeation began, its rate would be less rapid than in most of the British chiefdoms. In the judgment of the late Mr. Grant Allen, the marks of Teutonic colonisation in Surrey are few and far between. While Sussex has 68 village names of the clan type—such as Worthing, Rustington, Beddingham—Surrey has only 18. Examining the hundreds, or the lands originally occupied each by 120 free English households, confirmation is gained. Sussex has 61 of these hundreds, Kent 62, and Surrey but 13.[4] To get a just comparison, we should add to Mr. Allen's statement the reminder that the acreages of Kent and Sussex are each about double that of Surrey. The ratios of hundreds still remain striking. There is a defect in this method of treatment—the argument is negative. What one most desires to know is, to what extent the pre-Roman inhabitants clung to their homesteads.

When the Romans came to Britain they found the Surrey corner occupied mainly by the Atrebates, a tribe belonging to the insular branch of the Celts whom Professor Rhys named Brythons, but who are, in general, ambiguously termed 'ancient Britons.' There can be little doubt, however, that Goidels and Iberians were also present. The old ideas of extermination of one race by another are now given up.[5] The writer of the Anglo-Saxon section of the 'Victoria History' thinks that there is no reason why the discoveries of General Pitt-Rivers, near Salisbury, should not be paralleled in Surrey. The chalk is common to both counties, and there are Roman remains in both. It may be that the kings of Kent and Wessex were content to exercise domination over the Britons of the North Downs, without actually planting colonies there until Christianity had, in a measure, prepared the way.[6]

From what has been said previously, it will be understood that little importance need be attached to the disappearance of the Iberian or Ivernian speech. Languages are fugitive, peoples permanent. Although the Iberian tongue had not long been extinct in Ireland in the ninth century,[7] in Britain it fell into disuse much earlier. The late Canon Isaac Taylor said that this 'dark speech' is traceable only in such words as Caithness, Hibernia, Siluria —some half-dozen in all. The statement is probably incorrect. A specialist of higher authority, Professor Rhys, speaking of the names of our rivers and brooks, avers that there is probably no county in the kingdom which would not supply a dozen or two such names that would baffle the cleverest Aryan etymologist, because they belong, in all probability, to an earlier non-Celtic, non-Aryan language.[8] The first syllable of the name Caterham has long been a cause of discord among philologists. We select a few other strange names, other than designations for water. Worms Heath, Hogerty Hill, Croydon, Jolwynds (near Leith Hill), Boteras Hill (Nutfield), Chantersluer (between Leigh and Horley), and Duppas Hill, beloved of John Ruskin, will serve as touchstones.

Once more recollecting that we must not strain the evidence of language very far, let us look at the matter a little in detail. In 'Words and Places,' Canon Taylor truly observed that river names are everywhere the memorials of early races. Towns and villages may be destroyed, but these natural features remain. Throughout the whole of England, he supposed, there is scarcely a river name which is not Celtic[9] (or it should be added, pre-Celtic).

The Thames (*cf.* Teme, Tame, Tamar) is the quiet, still, or spreading water, doubtless a good description of the old, unembanked river.[10] The Wey, like so many other river names, implies 'water' (*cf.* Wye, Medway, Solway).[11] The Hoggsmill has an alternative name, the Ewell, which has been thought synonymous with Ouse and Esk.[12] The Wandle, or Vandle, is the 'little water,' as opposed to the Thames.[13] The name Wandsworth is probably derived from the river name Wandle, as Weybridge and Molesey are taken from the Wey and Mole respectively.[14] The Emlyn, another name for the Mole, is considered to be derived from a Celtic word meaning 'mill.'[15]

Next to river names, in order of permanence, are those of hills and mountains. To the early settler all rivers were alike 'water,' all elevations, 'hills'; later comers, mistaking the purport of the terms, frequently reduplicated the nomenclature. Most noticeable of Surrey hill-names is the Goidelic suffix *dun* (Welsh *dīn*), meaning a hill fortress. 'Always look out for the *dons*,' says Mr. Warr, of Eastleigh, with his usual acumen ; 'the Britons lived there and the Neolithic people before them.' In confirmation of this maxim, it may be mentioned, that though Farthing Down is chiefly famous for its Saxon remains, there is good evidence that the Neolithic folk had trodden its slopes ages before. Save for a cart track here and there, or the bare patches around a lichened oak or immemorial thorn, the compact turf remains as it was thirty centuries ago ; yet where a portion of greensward had been abraded by horse hoofs, we picked up a round scraper with a beautiful surface like that of white earthenware—De Mortillet's *cacholong* glaze. There are also remains of entrenchments on this down. Riddlesdown, Tillingdown, Banstead Downs, and the rest, tell of early settlements. London itself (Londunum or Londinium), though of later selection, is the fortified hill on which now stands St. Paul's Cathedral.[16] Then we have Chaldon, Coulsdon, Croydon, Waddon, Selsdon, Wimbledon, Bandon Hill (a reduplicated name), Ritherdon (Tooting), and Dunsfold (in Wandsworth parish). If we cross beyond our area, we get Clandon, Worplesdon, and others. Chessington is disguised ; it was the Domesday Cisendune, and was spelt Chessingdon as recently as 1814 (Manning and Bray's 'Surrey'). Malden and Morden are Meldone and Mordone respectively in Domesday Book, but these are essentially settlements on clay soils ; hence, though Canon Taylor speaks of *-den* as a 'loan-word' from the Celtic, names which fluctuate between *-den* and *-don* must be approached only by the expert philologist. It is somewhat more probable that these two villages are named from the Anglo-Saxon *-den* or *-dene*, signifying a wooded valley or lowland suitable for pasturage of swine and goats. Reverting to the dons, we are reminded that a friend sends us flakes and cores of flint from the earthworks at Bredon Hill, Worcestershire, where the raw material must have been carried from afar. Most remarkable, however, is Brandon, the Suffolk village where flint-knappers still live, and manufacture gun-flints and strike-a-lights. At Brandon the economical, and perhaps the hereditary, connections are very complete. Historically, the occupation of flint-knapping goes back for some centuries, and, in all likelihood there is a lineage traceable to Neolithic days. Nay, Mr. Skertchly believes that Palæolithic man also mined there for flint, and considers that the manufacture of flint implements for various purposes has gone on, without any, or with but slight, interruptions from the earliest times to this moment.[17]

Pendhill, or Pendell, near Bletchingley, gives its name to the mansions known as Pendhill Court and House respectively. The prefix *pen* (Welsh *pen*) here means a hill,[18] and we have in Pendhill a doubling of synonyms caused by ignorance of the original term. Naturally, along with *-don* we get the correlative *combe* or *coombe* (Welsh *cwm*, a cup-shaped depression). This occurs in Coombe Wood, Kingston ; Coombe House and Lodge, near Addington ; Alderscoombe, North of Cardinal's Cap ; Pebble Coombe, Betchworth ; Addiscombe, Hinchcomb, Hascomb, and Thorncombe.[19] In Gomshall we get a slight variation. One particular with respect to Coombe House, between Addington and Croydon, is of interest. Mr. E. A. Martin tells us that near the mansion is an ancient well, which tradition states was used by pilgrims on their way to Becket's shrine.[20] May not the well be of still earlier date ?

The Atrebates, or Surrey 'Britons,' preserve, in their name, a Gaulish relic. Professor Rhys thinks that it is a Gallo-Brythonic word, but that it may have been common to Goidelic also. Anderida, 'the uninhabited place,' the district of giant oaks and stiff, impervious clay, has often been referred to. Noviomagus has the root *mag* (a field or plain), which like the *tre* in Atrebates, is probably both Brythonic and Goidelic. Hence if Noviomagus be our hunting-ground at Woodcote, we may carry back its settlement as far as the incursion of the Goidels.

Taking an extremely Celtic county as a contrast to Surrey, Canon Taylor gave these figures as representing the proportion of Celtic and non-Celtic names of villages, hamlets, hills, woods, and valleys :[21]

SURREY.		CORNWALL.	
Celtic -	8 per cent.	Celtic -	80 per cent.
Anglo-Saxon -	91 ,,	Anglo-Saxon -	20 ,,
Norse -	1	Norse -	1 ,,

Once more we see how needful it is to apply the language test discreetly. Differences in the proportions of Celtic place-names might be expected, but this great disparity must surely under-estimate, relatively, the Celtic element in Surrey blood. Granted, we will suppose, that time brought a reversal of position as between master and serf in the two counties, the Celt preponderating in Cornwall and the Teuton in Surrey. Teutonic domination in Surrey would not therefore preclude the absorption and amalgamation of large numbers of Celts ; to suppose that the latter were killed off is unreasonable. We might as fairly argue that the Celtic subjugation of Surrey, and the re-naming of Iberian places, implied the extermination of the Neolithic folk, a conclusion which recent studies tend to shatter. Mr. Gomme sums up the case for amalgamation so admirably that we venture to quote his passage in full :

'Mr. Elton has noted some rude and barbarous customs surviving in folk-lore which are non-Aryan ; Mr. Beddoe has identified surviving types of non-Aryan physiognomy ; General Pitt-Rivers has discovered a place of conflict between a short dwarfy people and the Romans ; Professor Rhys not only points out some considerable remains of the non-Aryan beliefs surviving in Celtic heathendom, but absolutely identifies Druidism as a non-Aryan cult ; Professor Boyd Dawkins, as we have already seen, points out that the non-Aryan farmer introduced the cereals and some of the arts used by his Aryan successor ; and I myself have sought to trace out evidence of the existence of totemism in Briton by its survival in folklore—totemism being primarily a non-Aryan cult, and obtaining among the hill tribes of India who helped to form the Hindu village community.'[22]

Nor is the case for the persistence of the Celt a whit less strong. In some places, like Chester and Exeter, we know that part of the city was English and part Celtic. Even in counties which are generally reputed to be almost purely Anglo-Danish, as Lincoln, Norfolk, and Suffolk, the non-Teutonic, *i.e.*, Celtic and Iberian types of feature abound. and similar characteristics are not rare in Jutish Kent. Professor Freeman and Sir F. Palgrave have collected facts proving that at the end of the sixth century independent Celts held out in such inaccessible places as the Fens. There were always at least three modes by which the Celtic and pre-Celtic types would be preserved : by sparing the women, by enslaving some of the men, and, in towns, by allowing some of the conquered to remain as fellow-citizens.[23] Altogether, there is a strong presumption that everywhere the Celtic element was represented, here and there strongly, but nowhere absent. More than this, Dr. Rolleston contends that since the age of the Tudors the Celtic element (using the term in its wider sense of pre-Teutonic) has reasserted itself, and has permeated the Teutonic region. 'Scottish Highlanders have poured into Glasgow, Edinburgh, and London : Welshmen have poured into Liverpool, Manchester, and all the great towns of England : Irishmen have poured into every part of the British dominions.'[24] Extremes meet, movements often tend to circles, and it seems as if the old Celtic element of Surrey is to encounter and fuse with a newer Celtic element from the West. For, if colonists, long absent from the mother country, are to be considered trustworthy observers, the Celtic characteristics are gaining ground in suburban London.

Inhabited sites and the dwellers on those sites suggest the question, What was the population of Neolithic Surrey ? With a full knowledge of the pitfalls besetting the subject, we venture to indicate a method of getting a rough estimate. That caution is doubly and trebly necessary, is evinced by the fact that such a writer as Professor Boyd Dawkins contents himself by saying merely, 'The population (in Neolithic Britain) was probably very large.'[25]

We will assume that the refuge camps at Cardinal's Cap and at Wimbledon were existing together towards the close of the Neolithic period, in other words, at the transition between the Stone and Bronze stages. In reality, Cardinal's Cap was perhaps the earlier work, but it is convenient to consider the overlapping years when Iberian and Goidel began to settle down, but when any older camps of refuge would still be required for purposes of clan defence. Suppose that the clans located around Cardinal's Cap and Bensbury have retired to their respective fortresses, for protection either against each other, or against a third tribe. How many people would be collected in each enclosure ?

The quasi-circular camp at Cardinal's Cap, with its 25 acres, would have a circumference of 1,233 yards. If we suppose that one clansman was necessary to defend each yard of the outer rampart, we get a garrison of 1,233 men, and if we imagine a reserve of one-third to line the inner defences, we shall get an additional 411, or 1,644 in all. Making allowance for women and children within the camp, we could not place the total lower than 5,000. The undefaced camp at Wimbledon covered 14 acres, and being circular, had an outer rampart of 922 yards. Computing on the same method as before, we should get about 3,740 people. This gives us 8,740 human beings in the two camps. We might safely make up the grand total to at least 9,000, by considering that, of the tribe centred around Holwood Camp, just over the Kentish border, some members at least would be geographically in the Surrey corner, since there is no natural barrier corresponding to our modern artificial boundaries. For our present purposes, these Holwood tribesmen are not refugees, but farmers and herdsmen in their homesteads. It will be remembered that our Surrey nook comprises a rectangle of about 14½ by 13 miles, and allowing for an uninhabitable region near the Thames in the extreme North-East, we may call its area 180 square miles. Nine thousand people to 180 square miles gives 50 to the square mile. If the result be considered too high, we repeat that the estimate is only tentative. Also it is fairly certain that Surrey, whilst more thinly populated than counties like Wiltshire or Suffolk, was far more densely peopled than the country as a whole.

If we may refer to the linguistic test once more, it is to give a comparative estimate, based on philological grounds, of the populations of Surrey and Suffolk, during the late Saxon period, about 1,000 years ago. Canon Taylor found that of the total number of place-names in Surrey, 36 per cent. have terminations like *wood*, *holt*, *hurst*, *ley*, *den*, and *moor* ; 12 per cent. in *don*, *combe*, *ridge*, *hill*, etc. ; and 40 per cent. exhibit such suffixes as *ham*, *worth*, *cote*, *ton*, *sted*, or *borough*. He therefore proposed a classification, not into Teutonic and pre-Teutonic, but into settled and unsettled districts. From the figures given, he inferred that the proportion of uninhabited to inhabited places was 48 : 40. Of course, the connotations of place-names ten centuries ago were more of a reality than they are to-day, yet some of the divisions are faulty. The *-dons*, we have seen, were prehistoric sites. On the same basis 65 per cent. of the place-names of Suffolk denote habitations, 18 per cent. wood and moorland, and 7 per cent. hills, hence the proportion of unsettled to settled spots was 25 : 65. Canon Taylor concluded, that the densities of population in Suffolk and Surrey, at the epoch under review, were as 65 : 40, or 13 : 8. At the time of writing (1873), the ratio was 13 : 48.[26]

With all its sources of error, this rough-and-ready guide may help a little in our conjectures of the populations even in the earlier Neolithic period. We must recollect that Suffolk contained the flint-working settlements at Brandon, Icklingham, and Lakenheath. The survival of the flint industry at Brandon has been alluded to ; even now this trade is by no means insignificant, and about two years ago the village supplied 14,000 tinder-boxes to the Yeomanry in South Africa. In some districts of Suffolk, worked flints of the Neolithic period are found in incredible numbers. Then we have to consider the lake dwellings at Thetford, and Barton Mere, near Bury St. Edmunds. In addition, Suffolk was pre-eminently a county for tillage, and its population would perhaps be far above the average.

Whilst working with Canon Taylor's figures as a guide, we think it probable that they give too low a proportion for Neolithic Surrey. The inhabited places of Suffolk, as existent 1,000 years since, would be hugely increased by a more systematic Teutonic settlement there, although, as has been said, the pre-Teutons remained in great strength also. Being in the South-East of England, Surrey received, and doubtless in no small degree retained, the first inrushes of each band of prehistoric immigrants, so that the Teutons would find the county well held. The chalk downs of Surrey were not far inferior for habitation to those of Wilts and Dorset. Its dry heaths were exceptionally fine ; until recent times, Surrey had one-third of its area consisting of commons. The loamy vales and breadths of stiff clay were very acceptable to the later tribes of pre-Roman folk. Hence the population could scarcely have been small. The number of barrows formerly existing, the various earthworks, the well-trodden primitive roadways, all point to one conclusion. Surrey was, indeed, to all seeming, one of the early hives of agricultural and pastoral industry. Outside this and similarly favoured tracts, the population would be sparser. The settled districts were islanded from each other by leagues of forest and stretches of swamps, so that when the inhabitants of all the elevated or well-drained regions were totalled up, the result for the whole country would not be imposing.

CHAPTER XI.

MISCELLANEOUS CONNECTING-LINKS.

THAT tree-worship formed no small element in the lives of pagan peoples, and among others, of Aryan races in particular, there is abundant evidence.[1] One curious survival was practised in the village of Warlingham as late as 1730. Manning and Bray state that in spring the boys of Warlingham went out to the orchards of the parish, and whipped the apple-trees to insure a fruitful crop, after which they carried a little bag to the house of each owner, 'and the good woman gave them some meal.'[2] Some writers have been content to ascribe the origin of such customs—once common all over the country—to the rites performed in honour of the Roman goddess Pomona, but the widespread and manifold ceremonies of this nature, especially in the Celtic parts of Britain, clearly speak of earlier times. The reader will recall other analogous customs; we will mention one only—the May processions, in the streets of London, of the once popular 'Jack-in-the-green.' In such works as Frazer's 'Golden Bough,' and Grant Allen's 'Evolution of the Idea of God,' such customs are collated, and traced back to primitive tree-worship.

Something has already been said concerning the yews of the Pilgrims' Way. Contrary to what might be expected, there seems to be no clear proof of the probable employment of the yew in early tree-worship, although yew traditions and associations would form a literature in themselves. Among the folk-lore of the yew, there was once a belief that, if the tree were seen in dreams, it portended the death of an aged person.[3] Wreaths of yew, along with sprigs of willow and rosemary, were laid on biers at funerals :

> ‘Lay a garland on my hearse
> Of the dismal yew.’

One favoured spot for the planting of yews was the parish churchyard. Theories to show why this place was selected are many, and do not here concern us. From personal inspection of scores of English churchyards, we have found that the position of the yew in the grounds is usually South, less frequently South-West and West, and rarely North. In the Surrey corner, Nutfield, Oxted, Bletchingley, Barnes and many other graveyards, have this grisly tree on the South side. At Coulsdon and Buckland it stands on the West, at Church Cobham and Little Bookham South-West. Farley (East Surrey) has two yews West, and Wimbledon one South, and one West; Warlingham two South, and one West; the yew at Chipstead is to the North of the church, as are the two at Limpsfield. The magnificent specimen at Ashtead, standing, it will be remembered, close to an ancient camp, must, from its size, be of great antiquity, as also must be the Tandridge yew, with its girth of 30¼ feet. This latter tree was specially admired by the late Mr. Louis J. Jennings. Parenthetically, we may mention curious, and obviously late, substitutions for the recognised churchyard trees. Mitcham has two walnuts, Great Bookham five walnuts, and Kingston-on-Thames several acacias.

What has all the foregoing to do with the prehistoric past ? Just this : the yew suggests much that is emblematic, much that has religious or superstitious significance. [Mr. Grant Allen's ‘Evolution of the Idea of God’ (chap. vii.) may be consulted on this point.] And, as it is likely that the yews of the Pilgrims' Way are successors of trees dating from remote ages, so it may be with the graveyard yews. For the village church itself often occupies such a position that there is forced upon us the idea that the building stands on a site formerly devoted to prehistoric, and therefore pagan,

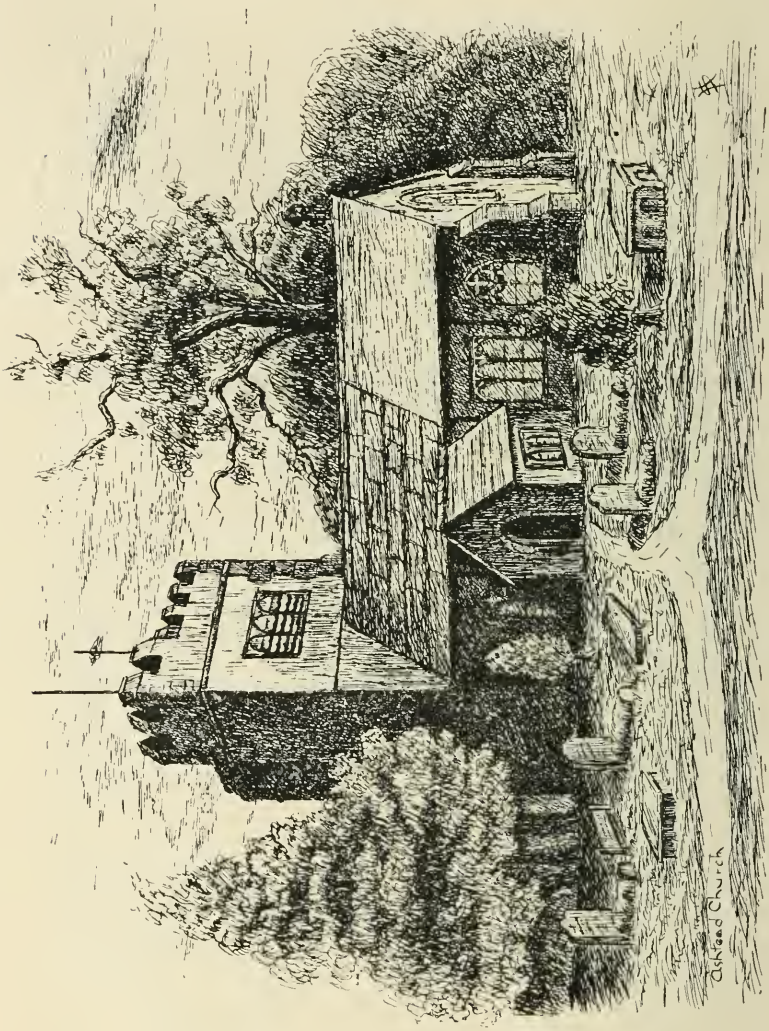


Fig. 5.—Ashtead Church and its Yew-tree (from the South-East).

'Beneath those rugged elms, that yew-tree's shade,
Where heaves the turf o'er many a mould'ring heap.'

uses. Passing by Chaldon Church for the twentieth time, this idea grows in strength. What a commanding position, how attractive for early ceremonials, how naturally fortified for an age when the secular side of life could never be lost sight of! In these quieter times, the churches form landmarks easily picked out from afar—that is the commonest appreciation of their fine positions; in other days the hilltop meant security. Caterham Church is built at an elevation of over 600 feet above the sea-level; Chaldon, Coulsdon, and Chipstead about 500 feet; Merstham about 400 feet; Chessington 154 feet only, but, from its outlook, effectively greater. Even in the belt of London Clay the churches of Old Malden and Morden are at elevations of 93 and 106 feet respectively, the highest sites in the neighbourhood.

The striking position of Merstham Church claims a paragraph to itself. Its picturesque appearance, its font of Weald marble and other archæological curiosities, the delightful background of elms on the West, would alone entice the traveller along the Brighton road to linger a few minutes. The hilly fields near show some bold terracing on a large scale, apparently caused by the outcrop of harder strata of the Upper Greensand and Chalk. But, besides these bands, there are other marks and outlines which seem to betoken a Neolithic 'location.' Some confirmation of this opinion was yielded by the discovery, previously mentioned, of ancient relics in the rectory garden hard by. At the North-West base of the knoll on which the church stands is a pool, fed by a spring locally known as 'bourne' or 'bone' water; in fact, it is the source of one of the bournes before described. Every few years, after a wetter season than usual, the pool overflows, and the surplus water crosses the road, passes through a grating, and ultimately finds its way to the Mole. West of the church, too, is the spring, rarely dry, which supplies the water for the lake-like expansions in the Church Meadows. Manning and Bray refer to another bourne, which periodically bursts out at the foot of Merstham Hill, and joins the one which comes from below the church.[4]

The situation of churches near springs, as at Merstham, is frequently an indication of the annexation of pagan sites for Christian worship. Fountains, lakes, wells, and running water occupy a prominent place in the older religions of the world.[5] The Rev. G. S. Tyack, in his 'Lore and Legend of the English Church,' gives a large number of instances where churches have been built near 'holy wells.'[6] Stow speaks of several old London churches which must have been so built. Thus, there was a pool by St. Giles's Churchyard. North of St. Clement's Church was St. Clement's Well; there was also the famous Clerke's Well[7] (Clerkenwell). Holy wells were, in mediæval and later times, popularly believed to have curative virtues. The waters were taken for such widely-differing purposes as love-spells, maternity, and the cure of weak eyes, sore legs, and consumption.[8] The 'dressing' of the wells, or, rather, of the bushes near, with rags and scraps of clothing, and the throwing of garlands into the sacred waters, are customs well known to the antiquary. Though there is no evidence obtainable that the Merstham people ever 'dressed' their well, the likelihood is great. Tradition does say that the Canterbury pilgrims used to visit the spring—a probable proceeding, as the old track passes close by.

By the roadway, just outside Carshalton Church, there is a covered-up well, popularly said to have been produced by a blow from the hoof of Anne Boleyn's horse, and hence known as 'Anne Boleyn's Well.' Knowing how modern fictions become attached to ancient objects, the antiquary will perchance be quite as near the truth if he imagines the well to be very ancient, and sees in fancy a crowd of Aryans clustering round the spot. At Farnham there was a holy well dedicated to the Virgin Mary. It was situated in a cavern known as Mother Ludlam's Cave.[9] In a 'grove of ewtrees within the Manour of Westhall, Warlingham,' historians record that there was a spring which burst forth before 'remarkable alterations in church and state.' It was wont to disappear underground until it reached the end of Croydon town, near Haling pond. It is soberly chronicled that an overflow preceded the Restoration of 1660, the

Plague of 1665, and the Revolution of 1688.[10] There is no need to add that the spring was one of those bournes, or ‘ bone waters,’ now familiar to the reader, but the superstition attached to it affords another shred of evidence of the vitality of ancient cults.

Frequently, where there has been no demolition, one finds near the parish church such antiquities as barrows and megalithic monuments. Mr. Malden mentions a large mound near Abinger Church, and remarks that the situation is usual. There is some artificial work also near Addington Church. At this moment we recollect good examples at Fulstow, Owston, and Broughton, in North Lincolnshire. Instances are also recorded as occurring at St. Weonard's and Thruxton, Herefordshire ; in the former case, where the object was a mound, its sepulchral character was proved by excavation.[11] Mounds like this at Thruxton, often known locally as Castle Hill or Moot Hill, are variously assigned by antiquaries to Norman, Saxon, Roman, and pre-Roman times.[12] The later names, which embody theories, seem sufficient to some students to shut out the hypothesis of prehistoric origin.

In more than one English churchyard, we recall instances where the old ‘ cross ’ bears a strong resemblance to a pagan menhir, or standing stone, and we are led to infer that we have therein a connecting-link—that the Christians consecrated the stone to the new religion. A legend says that St. Paul's Cathedral stands on ground once occupied by a temple dedicated to Diana. Some think that the site was fixed upon still earlier for the worship of the Celtic sea-god, Ludd, and Mr. Clodd hints that the name may survive in Ludgate.[13] Some little support is lent to the Celtic theory by the fact that, when the Cathedral was being erected, a huge deposit of bones of oxen and other animals was found near the spot.[14] In Chapter VII. reference was made to a mound in what were formerly called Mount Nod Fields, Clapham. The name Mount Nod also survives about a mile distant, at East Hill, Wandsworth, being, in fact, applied to the little Huguenot cemetery there. From a consideration of the name, and from the fine position, commanding a view of the setting sun over Wimbledon Common, it has been thought that the Celtic sun-god Nudd was worshipped here. Nudd has also been identified with Pluto (' The Setting Sun ') and Dis, the father of the Celtæ.[15] Godstone, in the South-West of the Surrey corner, seems to represent, by its name, a British temple, rechristened. With it may be compared such names as Godstow, Godney (Somerset), and Godshill (= Idols' Hill) in the Isle of Wight.[16]

In Wales we find oval or circular churchyards, environed by roads, for which there is no obvious public necessity, causing one to think of the circle of stones which often surrounded a long barrow, and of such megalithic structures as Stonehenge and Avebury. When a foundation-stone is laid nowadays, a coin or two, and other objects, are enclosed. Few pause to think of the origin of this practice. But when we find horse-skulls placed under the foundations of churches or built into walls under the cornice, we are carried back to the pagan cult of the horse, and to a wider field of inquiry. Thorpe's ' Northern Mythology,' quoted by Mr. W. Andrews, asserts that before the first human being was interred in a churchyard, a living horse was buried. A dog, wolf, or goat was also placed under the corner-stone of the church.[17] These animals were substitutes for human beings, which were the victims when a Neolithic or Bronze Age barrow was raised. The subject of sacrificial foundations is an attractive one, and would lead us far out of the Surrey corner. Enough has perhaps been said to support the continuation theory as applied to particular cases. Allusion may, however, be made to the excavations carried on at Stonehenge in 1901 by Dr. W. Gowland. At the base of one of the pillars implements and mauls of stone were found packed among the rubble. The general opinion seemed to be that these objects were thrown in aimlessly as packing materials ; we hazard the conjecture that the interment was part of a ritual, analogous to the deposition of celts and arrow-heads in barrows.

It has been pointed out by several writers that our graveyard mound is the survival of the long barrow, and our gravestone of the menhir. The Rev. S. Baring-Gould, in his 'Book of Dartmoor,' has a plate containing an instructive series of drawings, entitled 'The Pedigree of a Headstone.' The development of the tombstone from the menhir is there well shown.[18] Similarly, the rude cairns and dolmens have developed into sarcophagi and altar-tombs, and the cromlechs into our round churches. The funeral banquets of Yorkshire and elsewhere are mild successors of the orgies of a barrow burial. We even have records of interment in an upright or a sitting posture. The orientation of our churches, and the burial of the dead in a line East-and-West, are considered to be relics of barbaric sun-worship. Barrows, lines of menhirs, and stone circles like Stonehenge, are often oriented. The curious reader who may care to pursue this subject will find copious details in Dr. E. B. Tylor's 'Primitive Culture,' Canon W. Greenwell's 'British Barrows,' and Mr. J. Theodore Bent's 'Ruined Cities of Mashonaland.'[19]

Parochial customs at times give us unmistakable links with the prehistoric age. Thus, when we read that Barnes village was formerly celebrated for its mummers,[20] we think, not only of rustics disguised in ludicrous attire, painted about the face, and girt with twisted haybands; we see not only the dancing and harlequinades, the presents of food, drink, or money, but, having called to our aid comparative custom, we can fancy much more. Before St. Thomas's Day (December 21) or Christmas Day were part of the Church Calendar, we had the Roman Saturnalia, and at the back of this, the rude dancings, ceremonial or festive, of painted heathen around a Neolithic camp fire. Another custom, the origin of which is not ascertainable by the historical method, was the annual pilgrimage of youths and maidens, on Good Friday, to St. Martha's Hill, Guildford.[21] The fact that music and boisterous dancing formed the main features of the proceedings shows that the observances could have no connection with the solemnities of the Christian anniversary. Rather, perhaps, must we look for an explanation in the earth circles on the hill, and the later building of a church in such a conspicuous position. The circles may still be traced amid the bracken (1903), and flakes are abundant near the church, or rather chapel. On the North side, too, are two mounds, which may possibly be small tumuli, so that a prehistoric site is indicated. Mrs. Gomme helps us in this matter, with the information that when the early Christians erected a church where a heathen temple had formerly stood, they performed a dance to their God as the heathen had done to theirs.[22] As the ages rolled by, however, practices which may have been sanctioned by the Neolithic medicine men and their immediate successors,[23] would not be condoned by enlightened leaders of opinion.

Ball-play or football was formerly a popular pastime in many Surrey villages on Shrove Tuesday. Hone, in his 'Every Day Book,' mentions, as favourite spots, on the Middlesex bank of the Thames, Teddington, Twickenham, and Hampton Wick; on the Surrey side, Kingston. In Dorking the practice persisted so obstinately, that, notwithstanding general condemnation of the disorder, the attempts to put it down met with great opposition. In 1902, the celebration was a mere rough-and-tumble fight.[24] The sport used to be preceded by a perambulation of the streets by the players, who were grotesquely dressed. Three balls, red, white, and blue, bearing the mysterious legend, 'Wind and water is Dorking's glory,' were carried in the procession. There were other curious features, but the prime fact to notice is, that the contest was between those living East and West of the church. When we learn that the Dorking observance is not an isolated one, but that such customs are widespread and that counterparts are easily found in the ball games of the Seneca Indians and the Greek phratries, we see the force of Mr. Gomme's contention that in these local struggles we have relics of the old clan feuds. In

Wales, cases are cited, in which, not only are race traditions preserved, but a distinction is made between hill folk and valley folk.[25]

A custom, seemingly idiotic and meaningless, was that of the election of a mock mayor at Garratt, or Garrett, Wandsworth, a well-known institution a century ago. Dramatised by Samuel Foote in 'The Mayor of Garrett,' the rowdy scenes have become familiar to many. But the ceremony was not a peculiar one. It was formerly observed with such faithfulness of detail and in such a vast number of places that Mr. Gomme considers that it cannot have arisen from mere local caprice, but that it is an ancient observance whose significance has long been lost. Similar practices are recorded from St. Germans, Lostwithiel, Bodmin, and Polperro, in Cornwall ; Leigh (Lancs), Hanley, Kidderminster, Mold, and other places. There is no traceable connection with a calendar festival. By studying comparative custom, a parallel is found in the riotous election of leaders among the non-Aryan castes of India, and Mr. Gomme sees no reason why the frolics in Britain should not express, in survival, the same village festival with all its ethnic symbolism.[26]

We notice lastly the ancient custom of 'beating the bounds' on Ascension Day. It has been kept up in Battersea and other parts of London within the last few years. As recently as June 10, 1903, the custom was revived at Talworth, Surbiton, when, in spite of a downpour of rain, about 15 miles was traversed by the beaters. The observance, in these practical days, is intended to fix the boundaries and landmarks between adjacent parishes, and it may be held annually, triennially, or every seven years. Nowadays a boy is playfully bumped against the boundary-stone ; formerly he was publicly whipped there, that the memory might be lasting. At the outset, severer ordeals would have to be undergone, involving, it may be, spilling of blood. The worship of the Roman god Terminus, the patron of boundary-stones, helps us to understand the subject, but there is little doubt that we must travel back to the primitive menhir, would we arrive at the source of the custom. It is interesting to observe that Mrs. Gomme connects with this ceremony such children's 'Custom Games' as 'Thread the Needle' and 'Round and round the village.'[27]

In Chapter VII. allusion was made to one or two stones which may have been menhirs. London stone, in Cannon Street, deserves first notice. Forty years ago a writer in *Notes and Queries*, in the course of a correspondence on this subject, said that this famous stone was a porphyry. He asserted that it was the milliarium from which the Romans reckoned their mileages, but that it was previously an altar of the temple of Diana, on which the old British kings took the oath of their accession, laying their hands upon it during the ceremony.[28] This tradition lingered until Jack Cade's time, for not before he rushes and strikes the stone does he think himself entitled to exclaim, 'Now is Jack Cade Lord Mayor of London.'

A further legend states that the relic was brought from Troy by Brutus, and that the prosperity of London is connected with it: 'So long as the stone of Brutus is safe, so long will London flourish.' Mr. Clodd thinks that the stone is a dedication to Hermes or Mercury, as the god of boundaries;[29] it is possible that it may reach back to the early Aryan cultivators of Britain, to whom the worship of 'stocks and stones' would be familiar.

We have a suspicion that the 'King's Stone,' at Kingston, the seat on which the South Saxon monarchs are reputed to have sat at their coronation, is a broken menhir. It stood for centuries in the ancient chapel of St. Mary, which was attached to the South side of the parish church, but which was destroyed in 1730. We are obliged to say, in fairness, that the ceremonial use of the stone is not usually considered to reach back beyond the Heptarchy.[30]

The last of these venerable objects is the stone under the Coronation Chair in Westminster Abbey, which is said to have come from Ireland by way of Scone. All kinds of fables are bound up with it; one account even says that it is the stone on which Jacob laid his head at Bethel. Whilst considering that the stone may be a relic of prehistoric worship, we give references to papers in which a full discussion of its history may be read.[31] Sir Herbert Maxwell sweeps aside ruthlessly the tissue of legends regarding the stone, but at the same time, he approaches a similar conclusion to that just advanced. He states that the stone was carried off from Scone by Edward I., in 1296 ; that Professor Ramsay found it to be a dull reddish or purplish sandstone with a few embedded pebbles ; and that the late Mr. W. F. Skene said that the rock did not occur among the geological strata of Palestine, or of county Meath, but was common around Scone. Sir Herbert Maxwell therefore concludes that the stone is an ‘ ordinary boulder, chosen by chance for the inauguration of some early Pictish kinglet, whence it acquired an exoteric dignity, to be enhanced by each successive coronation.’ And, until fresh facts are brought forward, be our speculations what they may, the expressive formula of Uncle Remus must be ours, ‘ We’d better let it go at that.’

CHAPTER XII.

THE NEOLITHIC IMPLEMENTS OF THE SURREY CORNER.

(1) THE ALLUVIAL FLATS.

WE now deal with the less perishable relics left by Neolithic man in the Surrey corner, namely, his weapons and tools of stone. As we intend to describe discoveries made by ourselves, we may be permitted to make a division of the area, like that of Cæsar's Gaul, into three parts. These parts have some geological, and it is probable, from the antiquarian standpoint, some chronological significance. There is first the tract consisting of alluvium near the Thames, the silt and mud of the river-bed itself, and the 'made earth' and comparatively modern deposits of gravel near its margin. Secondly, we have a series of gravels and sands of various ages, dotted here and there throughout the district. Thirdly, there is the chalk tract of the North Downs.

Considering these divisions in the order indicated, it will be remembered that the area which is now occupied by alluvial tracts of marsh, meadow, and peat, was formerly covered with quagmires and lagoons, interspersed with small eyots, which were habitable only by pile-dwellers or crannog-builders. In our wanderings by the Thames foreshore, we have noticed, at places as widely separated as Sonning (Berks), Twickenham, Battersea, and Erith, numbers of worked and unworked flakes, together with knives and scrapers. On the Essex shore, at Grays, flakes are also abundant, but, as the flints are often from a dozen to a score of yards from the bank, the search can be carried on only at low tide. The reader may gain some idea of the discomfort, not to say risk, of striding from one pebbly islet to another, when a false step or a miscalculated leap means a descent into a slough of blackest Thames ooze. Yet some of the implements obtained by collectors might be worth the chance of such a disaster. Trimmed borers, tapering like a wooden skewer, exquisitely slender knives, and cunningly notched saws, have been yielded up by this alluvium. These flints are highly polished by the constant, but gentle and imperceptible friction of the tiny particles of silt. The patina, or stain, is dark, in some instances verging on black, but never an actual jet black. Some of the flint tools which we have seen in the possession of a brother collector have remarkable shape and facies. One must be the very prototype of the modern spokeshave. Others have indications that they were employed as rimers or reamers, for straightening and enlarging holes made by the ordinary boring tools.

On a balance of evidence, we are strongly of opinion that many of the flints of the Thames side are memorials of pile-dwellings, and, as such abodes continued from the lithic to the metal stage, some of the flints are accordingly found of a late pattern—they may actually, it has been supposed, run on into early Saxon times. Hints have been thrown out that certain scrapers were even employed in the trades of earlier civilised London. At present, this is hypothesis, but there is a probability that rounded scrapers or 'sleekers' were used in historic times by dressers of hides in preparing leather. To this day the leather worker calls a particular smoother, made of iron, a 'stone,' and one could readily make a fair list of the use of flint tools in very late times.

Here we may meet the objection often raised as to the genuineness of these flakes. In places like the Thames bed and parts of downland, the flakes are so abundant that it is argued that they cannot all display human handiwork. But the expert knows that each chip carries its own marks of origin—the portion of the striking-face (De Mortillet's *frappe* or *plan*), the conchoidal curve of fracture, the 'bulb of percussion' at the butt end of the flake, the stain, varied according to the surrounding conditions, the high polish, rarely lacking, the very *éraillure*, or point where fell the flaking blow of the Neolithic hammer stone. (This term is sometimes applied to the incidentally-fractured surface of a bulb.) Since these signs do not appeal to the outsider, another kind of answer must be returned to the objection. To make one finished axe or adze, dozens of chips or spalls would be struck off and wasted. Only a very small proportion of these would be good enough to pick up for secondary working, so as to make tools and instruments. A workman might keep chipping leisurely for some time before he obtained a strip of flint sufficiently long and elegant to satisfy his critical eye that it would serve as his best knife. There is also the over-production due to idleness,—if that be not a paradox, and to superstition. Captain Cook found that the Australian aborigines preferred to strike off new tools to re-working the somewhat refractory material of the old ones. Barely a generation ago, a visitor to the Andaman Isles, chancing to be present in the dying days of the local Stone Period, saw a mother split off a long, slender flake from a core, cut her son's hair with this barbarous knife, and then throw the flake away. Let us think, too, of the long ages during which these tools of flint were used. The makers are gone, but they could not take their tools with them. These, being all but imperishable, must remain somewhere, and the archæologist is sometimes lucky enough to discover that 'somewhere.' Unlike the modern tools and machines of iron, which rust and decay in half a century, unlike those even of bronze, often fast perishing when dug up, and barely saved from destruction by the barrow digger, the flint appliances endure, with little change, from age to age, and the wonder would be if chips and cores were not plentiful.

In addition to the minor appliances, polished celts and perforated hammers are frequently dredged up from the middle of the channel, at such spots as Battersea, Wandsworth, and Putney. Of these heirlooms, some were doubtless dropped from the stages of pile-dwellings, others may have been left there during inter-tribal struggles at the fords. It has also been mooted, with what support from facts we know not, whether the aggregation within limited areas has not been brought about by local eddies or backwaters. In the museums at Bloomsbury and Jermyn Street are the before-mentioned elegantly curved sickles from the Thames bed—how they have remained entire is a mystery.

In a position slightly differing from that of the alluvial flats, we have found flint tools in a field at Ham, in an area contained by that bow-shaped bend which lies between Kingston and Petersham. The soil of the field, which is about 100 yards South of the river, consists of sand and gravel, of relatively late deposition. There is a depression towards the West of the field, from which pebbles have been dug, either by modern farmers for economic purposes, or by Neolithic settlers for making implements; perchance, by both peoples in turn. There we have met with several carefully trimmed cores, and many small scrapers and knives. One tool, a flat fig- or pear-shaped chisel, had its cutting edge cleverly formed by the removal of a transverse flake. A very good hammer-stone, which, in all probability, struck off many of the flakes profusely scattered about, is shown in Figs. 6 and 7. The men who rived these flakes from the pebbles were most likely in the agricultural stage represented by the late Neolithic period, and were practically contemporaneous with the early pile dwellers. In imagination one can still see them in their log canoes, fishing with wicker nets woven from the osiers of the riverside. Eels and lampreys may have been as familiar then as in the days long afterwards, when the Domesday Commissioners noted Petersham as famous for these dainties.

Whilst inspecting the flowers in one of the beds at Kew, we have picked up flakes, but whether carried there with loam could not be determined. Once, when looking at a parterre of tulips, the eye rested on a tapering flake whose outline formed an isosceles triangle. The original flaking and the subsequent taps had produced what might serve as a light spear-head, but as the implement is not of the ortho-

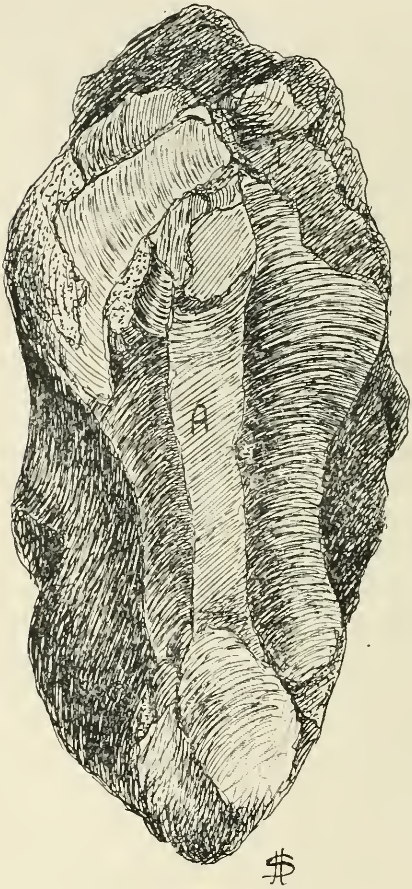


Fig. 6.—*Hammer-stone* (*Teddington*).

(Natural size.)

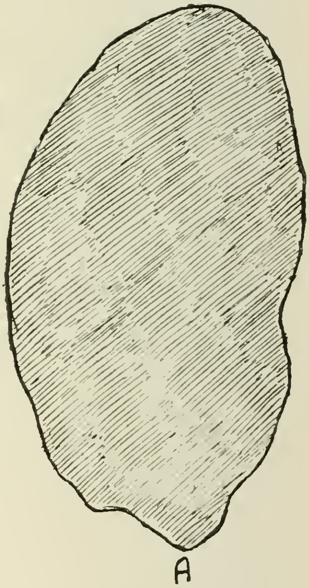


Fig. 7.—*Horizontal Section of Hammer-stone.*

(Natural size.)

dox pattern and workmanship, we hesitate to call it other than a trimmed flake.

Grouped conveniently with these riverside flints, because, apparently of the same age, are certain flakes and implements found in different geological conditions, namely, in the soil at the top of the drift gravels at such places as Clapham and Mitcham. We have ourselves picked up at Clapham a few of these silent witnesses to the presence of early man; others may be seen in various private collections. Three years ago, when some of the old mansions on the South side of Clapham Common were being pulled down, and the gardens excavated for a main drain, a local gentleman obtained, from the top mould, what he thought were two fine Neolithic implements. One certainly was such an object, the other was just as plainly a square gun-flint with the usual bevelled edges. The latter flint had its modern character attested by its lack of polish, its harsh touch, its small capacity for absorbing the heat of the hand. Shape and appearance sufficiently testified its use. The incident recalled an old puzzle of ours—why the discovery of gun-flints should be a rather rare occurrence. One, found at Warlingham, and another at Shawford, Hants, make up our list. Two facts have, however, to be borne in mind, and these go far to remove the perplexity. Gun-flints had, comparatively considered, a short life in England. Our Warlingham specimen might be, let us say, two centuries old, and during most of that period men were manufacturing these articles. A Neolithic scraper, picked up the same day from the same field, might be 3,000 years old, and for 1,000 years of that interval men were continuously making such tools. The other fact is, that properly made gun-flints would not be lost if due care could prevent it—they would be well used before being discarded. As regards the home-made gun-flints of the country people, such rough-and-ready specimens, if found, would be scarcely recognised even as substitutes for gun-flints.

CHAPTER XIII.

THE NEOLITHIC IMPLEMENTS OF THE SURREY CORNER.

(2) Sandy and Gravelly Sites.

As we stand near Cæsar's Camp at Wimbledon we endeavour, in fancy, to restore the conditions which produced the high-level drift gravels that form the capping.

So far as South-Eastern England was affected, the Ice Age had passed away, if indeed, that region can be said ever to have experienced the Ice Age, save in the climatic sense. A plateau of London Clay, surmounted, perhaps, with patches of pre-glacial gravels, and with fragments of the Southern Drift of Prestwich, stretched continuously from the Wimbledon Heights to Hampstead Heath. Across this plateau, at some unknown period, the ancestor of our Thames began its labours. Though this old river had, roughly, the same feeders and the same lines of drainage as its modern representative, its descent was steeper, and its volume probably two or three times that of the modern Thames. Torrential in times of storm, and having great erosive power, the river cut its bed deeper, and narrowed as it deepened. By continually altering its course, it left behind deposits of sand and gravel on either bank ; these patches are well known to-day in such districts as Ealing, Hanwell, and Wandsworth. The Wandle, now shrunken to an insignificant stream, most likely had its source much further to the South. The Beverley Brook, with its now tiny tributaries, had sufficient power to carve out, in the duration of ages, those cross ravines which now furrow the Heath, and to leave as witnesses those island-beds of gravel which we recognise as the oldest, or platform, deposits of the drift series. Digging beneath these drifts, we soon come upon the base of London Clay, and a good section of this stiff material is seen where it outcrops at the farm by the side of Robin Hood Road.

Palæolithic man appeared on the Heath either during, or soon after, the laying down of these high-level gravels, for his implements, scarce it is true, but still unmistakable, have been found in the drift.

Ages passed away before Neolithic man came hither to excavate his hut circles, raise the Bensbury Camp, and bury his dead near Tibbet's Corner. Some thirty centuries later, we come to the same spot early on a summer morning to watch the willow wren and wood wren, the meadow pipit, the long-tailed titmouse, and that rare songster, the goldfinch. At dewy eve we listen to the nightingale and goatsucker. Unknown, fortunately, to the multitude, are the nests of these birds, for the multitude is not yet ready for the information, nor for that which concerns one or two rare plants which still exist in overlooked corners. Often we pause to look over the pleasant realm of Surrey. Yonder, to the South, are the downs of Epsom and Banstead, and faintly shimmering through a haze of diaphanous blue are the heights of Leith Hill, Ranmore, and Headley. Through untold æons has the sculpturing of Surrey been in progress; man's engravings on these gravelly terraces are but of yesterday. One cannot fail to admire the taste, as well as the foresight, of the Neolithic men who chose this spot for a home—men of the foremost files they must have been. Many infallible signs of the Neolithic settlement have remained, in the guise of chipped tools.

A heath fire in 1901, followed by the ploughing of about an acre of ground, close to 'Cæsar's Well,' led to our discovery of a goodly number of knives and scrapers. Two or three of the scrapers were of the 'secondary duckbill' pattern, that is, they had a form resembling that of a duck's bill, and the rounded end had been prepared for use by a careful grading of the chippings, leaving the edge very effective for its work. Another scraper, shown in Fig. 8, is a pebble-made implement, having a good gloss, and a stain varying from yellowish to slaty grey. It has a portion conveniently removed to allow a firm grasp between the thumb and forefinger of the left hand. A marked increase on the right side of the natural thickness of the original flake aids this manipulation. A third scraper, oval-shaped with a hollow on the left edge, has a pearly or cream grey hue.

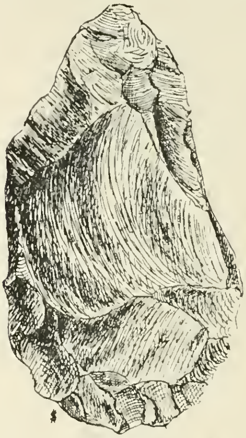


Fig. 8.—*Scraper* (*Wimbledon*).
(Natural size.)

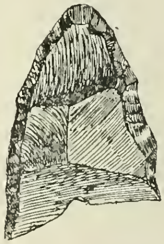


Fig. 9.—*Arrow-head* (*Wimbledon*).
(Natural size.)

It is rounded off after the ordinary duckbill type. Like the others, it is well smoothed by the incessant attrition in the sandy soil. Here also we found an arrow-head of uncommon type. It is of the single-barbed variety (Fig. 9). The under side is quite flat, and has been left untouched after its detachment as a flake. The upper surface has been dexterously prepared for the final trimming by four bold strokes, which have produced an equal number of trapezoidal facets. Then the edges, which are somewhat thick, have been elaborated by pressing off chips at a highly sloped angle. The tip is chisel-shaped, and has no after-workings, being formed by the removal of a single spall.

Within the confines of the camp itself we once picked up an implement of slaty grey colour, having its edges tinged with umber. Though we consider it of undoubted Neolithic age, it is of Palæolithic form and type, and may belong to the transition or 'continuation' period. Manufactured from a pebble, its butt-end has been left relatively thick. Oblique surface flaking and side trimming have reduced the thickness elsewhere, so that the implement tapers to a point. What kind of appliance it was—chisel, wedge, spear-head—who shall say? It was most likely intended for the last named, but served all three purposes, and perhaps others. One is reminded of Lord Avebury's question about the precise uses of a modern knife. He who can answer this latter question, can answer the former, it may be.

In other parts of the Heath, we have found many lustrous flakes, some of small size. Near the site of the old barrows, on Putney Heath, other specimens have turned up. As we leave the Camp and go down the declivity through the fields of the Warren Farm, and wend towards the footbridge over the Beverley, we notice a peculiar mixture of sand, loam. and pebbles. Some consider that we have here an outcrop of the Bagshot Sands. Several neat cores and knives form the spoil of these fields. One knife (Fig. 10) well exemplifies the deft flaking which is occasionally met with. There has been little assistance from secondary workings. The pebble was carefully chosen, for there is a natural hollow, which permits the thumb of the left hand, or the index-finger of the right, as the case may be, to get a tight grip. A 'chalk heel' or *talon*, is left at the stumpy end. and a few taps on the edge have given a finish to the knife. One is struck particularly by the shape of this instrument; in form and cross-section it is the veritable prototype of the modern knife-blade or razor. The patina is burnt umber. We have found similar, but clumsier, knives on the chalk downs at Warlingham, and at Shawford, Hants; these objects.

as will shortly be submitted, were apparently of earlier date.

If we pursue the Beverley sourcewards and search the fields on the London Clay, we shall find records of man's handiwork rarer, particularly in the bottom of the valley near New Malden. But when we mount Coombe Hill, pick our way through the woods on the right, and enter Richmond Park by the Robin Hood Gate, we soon reach better ground.

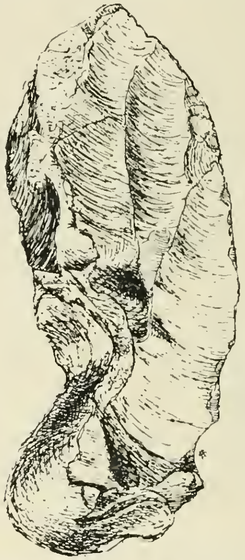


Fig. 10.—*Knife* (*Wimbledon*).
(Natural size.)

Coombe Wood itself is unsatisfactory, for oak-leaves, pine-needles, and humus are foes to the 'flinter.'

For a long time we obtained nothing from Richmond Park, save one or two Palæolithic flakes, brought probably with imported gravel. At last, men and rabbits, jointly and severally, cleared away two or three roods of turf near the Penn Ponds, leaving a bare, sandy waste. (The etymology of 'Penn' is disputed, but the name is comparatively modern, and, of course, has no connection with the Celtic *pen*.) As we had long suspected would be the case, the sandy soil yielded an arrow-head, a saw, two scrapers, and a tolerable abundance of cores and chips, with scraps of pottery. From another corner we obtained a well-wrought honey-coloured scraper of the orthodox horse-shoe form. A close scrutiny of rabbit burrows gave more specimens. The Bagshot Sands at Esher and Oxshott have not yet been very responsive, except as regards flakes, but could we plough a few 'lonely furrows' in these places, better results would no doubt follow. The eminence to the South of Claremont, conspicuous from afar by its cluster of pines, seems particularly promising. On a knoll above Esher we found a worked Palæolithic flake ; its presence there is an enigma, for we do not wish to suggest that man was in Britain during the Eocene period. It is fair to conclude that the specimen was dropped accidentally.

We cross to the Eastern side of Surrey, and ascend Croham Hurst. We are standing on an outlier of the Oldhaven and Blackheath Beds. The pebbles are perfectly rounded, there are no sub-angular or intermediate forms. In places, masses of pebbles are cemented into a conglomerate or pudding-stone. In the far-distant past the chalk which formed part of the dome of the Weald was dissolved away, leaving as a residue the insoluble silicate of alumina, the oxide of iron, and piles of rugged flints. Few or many, these knobby or angular flints were gradually borne down the slope by running water. We next find them forming a shoal or bank in the sea, at some distance from an old-world beach. On this bank they are rolled over each other unceasingly. Eventually the land is slowly upraised, and the pebble beach of which Croham Hurst is now one of the outer pickets stands up boldly. To what an extent the pebble formation once stretched may be judged by the rambler who knows intimately the wreckage in the fields from Caterham to Banstead, where some of the flakes have been struck off from these rounded flints.

Croham Hurst, like Wimbledon, was an ideal site for hut circles. In prehistoric times the hill must have been, as it is now, breezy, self-drained, and picturesque. Firs and pines now cover its table-like top, and around its ample base are pastures, arable fields, heaths, parks, and woodlands. The top is level, but the angle of repose of the pebbles—some 30°—is so steep, that an aggrieved tribe from Riddlesdown would have difficulty in climbing the shifting, slippery slope from the South. The flint-hunter may inspect at leisure the excavated hut dwellings, of which there are many. Mayhap, he will find, as we have done, flint tools which have escaped the keen eyes of the diggers. Mr. Clinch, however, did not come across many flints on the hill itself; he imagines that the rounded pebbles served as crushers or pounders, and that other pebbles, naturally broken in half, would form ready-made scrapers.[1]

We leave the Hurst at the South-Eastern corner. In the ploughed fields in this vicinity there are good indications of Neolithic flints. Keeping along the flank of the hills towards Addington, we observe that the Woolwich and Reading Beds have thinned out, and that the Oldhaven Beds rest directly upon the buff, clayey, Thanet Sands. Getting a little lower down, on the Chalk, we discover that good things are to be had for the searching. Mr. Polkinghorne has found there a well-wrought scraper and an exceptionally fine fabricator (Fig. 11). In the same locality we encountered a tawny tinted core, or rather, heavy implement. It is of circular shape and has a decided Palæolithic cast. The material seems a little different from that usually chosen in the neighbourhood. Being a surface find, however, and possessing rather sharp edges, we are reluctant, notwithstanding the acute edged implements of Farnham and Stoke Newington, to place it among the older artifacts.

Rising again, and partly retracing our steps, we come to Shirley Hills, with their remains of pit dwellings. On this classic ground the Oldhaven pebbles are curiously 'blanched' and pitted. Our most noteworthy record here is that of a clumsily-shaped knife, made by splitting an obstinate elliptical pebble lengthwise. An awkward boss on the upper side refused to answer to the blows of the hammer-stone, and was left in despair, but the edges are well managed. Still keeping to the same geological formation, we search the ground near the primitive encampment on Worms Heath. The numerous hut circles are marked on the map (p. 33) kindly drawn by Mr. Frank Percy Smith. Until diggings have been made on these sites, we have some hesitancy in deciding whether the circles belong to the Neolithic or the Bronze Age. General considerations would seem to indicate a late Neolithic occupation, and, at any rate, remains in stone are not absent. Above the pits, on the Western side of the Heath, where the turf has been pared to a depth of half a foot, we found a small fabricator, a beautiful white core, and a heavy, broad, duckbill scraper. Sparsely mottling the barren portions of the Heath, the trained eye can also detect the waste scraps of the Neolithic craftsman.

Fig. 11.—*Fabricator, or Trimming Implement* (*Addington*).
(Natural size.)

Coming next to the West of Croydon, the drift gravels of Mitcham Common and district must be noticed. A few Palæoliths have been recorded there, but our business concerns some beautiful Neoliths, disentombed from the mould which there caps the gravel to a depth of from 1 to 3 feet. Our implements from Mitcham Common and Beddington have a light walnut or buff colour, as if mimicking the stain of the Palæoliths. Mr. Polkinghorne found an elegant double-barbed arrow-head here, and Mr. I. J. Coleman, of the Battersea Field Club, has collected some very good specimens in the locality.

Pursuing our survey of the sands and gravels, we cross what Dr. Arnold called 'the surging hills of Surrey,' and take a peep at the Leatherhead district. Headley Heath has sufficient claims for a separate consideration. Walton Heath, with its neighbour, Banstead Heath, is a plateau between the basins of the Mole and the Wandle. The gravel there consists of rolled flints and pebbles from the Blackheath Beds, some green-coated flints from the 'Bull-head Bed,' or base of the Thanet Sands, and, lastly, irregular stones from the chert beds of the Lower Greensand, representing the deposits of the Southern Drift of Prestwich.[2] The position is good, though not so fine as that of Headley. As we look at the green flanks of Box Hill or the lofty beeches of Betchworth Clump, we recognise the suitability of the heath for modern abodes, whatever attractions it had in the past. Also we know that some old Roman liked the heath too, as proved by his erection of a villa there. The whole common is so densely covered with gorse, that only chance parings of the turf or excavations for gravel give the searcher his opportunity. Our scrutiny there has revealed nothing but flakes, yet we cannot but think that Walton was, like Headley, early fixed upon for settlement.* On a heap of road metal in the Walton district, consisting, as such piles often do, of flints gathered from the fields, we once detected a tolerably good heavy knife. There was also a broken flint having a large and perfectly-formed cone—not a half-cone, like the familiar 'bulb of percussion.' These cones are not, indeed, rare. They may occur in Neolithic work, but more frequently the dry, harsh feel and texture betray a modern fracture. We believe the knack of producing these cones may be learnt, and it is said that a hammer having a convex striking surface will assist towards this end. It will be seen that a cone is formed by a blow struck on the middle of the upper surface of a mass of flint. The striking-place, a mere point at first, is propagated downwards and outwards until it dies away in the substance of the nodule, when the waste material may be removed. Should the stroke fall near one of the angles of the perimeter of a flat-topped core which is polygonal in section, a flake is detached, and the customary bulb, or conchoid in relief, is formed. This semi-conoidal bulb, smooth or wavy, soon loses itself in the back surface of the flake, leaving a conchoidal 'bulb hollow' in the parent mass or nodule.

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* Since this paragraph was written, the removal of turf and the subsequent ploughing of some acres on Banstead Heath, which adjoins Walton Heath, have proved the correctness of this conjecture. Frequent visits, sometimes made when the soil was partially covered with manure, and therefore not well adapted to searching, resulted in our finding large numbers of flakes, flake-knives, duckbill and rounded scrapers, a well-wrought spear-point, two regularly-toothed saws, a curious borer, and a chipped axe-head of somewhat uncommon form. Besides these, we obtained seven arrow-heads, one of which was a 'winger,' of good workmanship. One of the saws has a cunningly-devised hollow for the thumb, produced by the abrupt fracture of a flake before its course was completed. But to write of these recent discoveries would require an additional chapter.

Many years ago, flakes and arrow-heads were discovered on the West of the railway embankment at Redhill.[3] The soil there was Lower Greensand, with little or no superficial drift; the site is now occupied by houses. The Lower Greensand of Reigate Heath has been reviewed in connection with the barrows there. In the fields around Buckland, where the geological conditions are similar, we have collected many flakes, scrapers, and cores, as well as a rudely blocked-out axe. All these had a good gloss, and had been made from pebbles, not from the impure, cherty flint of the neighbourhood. Between the years 1848 to 1860 great numbers of flint implements were recorded from this quarter of Surrey.[4]

The last sandy site to be mentioned is Godstone Green. As we come down the scarp face of the Chalk from Caterham or Woldingham, towards the Lower Greensand at Oxted or Godstone, we are impressed by the increasing rarity of flakes. Such specimens as we meet are of a cherty composition. Yet when we reach the Lower Greensand itself, as represented at Godstone Green by the Folkestone or Upper Sandgate Beds of that formation, we get evidence of early man's comings and goings. Wherever turf has been removed, on a well-worn cricket-pitch or under an old horse-chestnut, we have found a flake or two, of the type usual in sandy settlements. These flakes may have come from the barrows, now levelled, mentioned in Chapter VII., but there is a possibility that erstwhile there was at this spot a village of the late Neolithic period. At Limpsfield we have gathered flakes under similar circumstances.

The subject of sandy sites, often far remote from the source of flint supplies for working tools, involves several inviting problems. Some of these sandy districts have long been noted for their excellent and highly-wrought implements, especially arrow-heads and knives. At Motteston, in the Isle of Wight, there is a Lower Greensand ridge on which stands a menhir or longstone. A valley of some depth separates the Greensand from the parallel range of Chalk hills, known as Five Barrow Down. The latter name indicates that the Newer Stone men buried their dead there, yet. for some reason, it seemed preferable to carry their flint to the Greensand near the menhir, and manufacture contrivances there. We have proved, by examination, the paucity of flakes on the Chalk, and the abundance of well-trimmed flakes and implements on the older formation. On the shore at White Park Bay, near Ballintoy, county Antrim, there is what the guide-books call a raised beach. It was, in reality, a huge flint factory and kitchen midden combined, though a slight elevation of the land has given it the character assigned by local writers. On the sandy dunes formed by this upraising and by drifting, we found thousands and thousands of flakes, interspersed with the shells of unnumbered limpets and periwinkles. Hut circles have been discovered near the spot. Whilst the original floor is represented by a black band only 3 inches thick, where the pits have existed the deposit reaches a depth of half a yard. Presumably, the flint for the workers came from the chalk, which is not, however, exposed at that precise spot. Moreover, as the Cretaceous formation in Antrim has been overlaid by tabular sheets of basalt, the chalk has been indurated to an astonishing degree, and the enclosed flint has been rendered so exceedingly splintery, that the primitive men must have had a weary task to discover good raw material. In the valley of the Don, where the pigmy flints found by the Rev. R. A. Gatty were probably fabricated, the nearest supply of flint would be the Yorkshire or Lincolnshire Wolds. scores of miles away. The Yorkshire pigmies, it would seem, though the fact is not stated, were resting on fields of loam ; the Lancashire midgets were lying in a peat-bed. The main point is that they were remote from the source of flint masses. In Surrey, we have quoted numerous examples of sandy sites. At some distance from Scunthorpe, in Lincolnshire, associated with the manufacture of instruments, is another workshop or settlement. The soil is of blown sand resting on the Pecten Bed of the Middle Lias. Except in so far as drift pebbles have been called into use, the flint must have been derived from the Chalk, some miles away. Here arises the alluring topic of the bartering of flint as raw material, but we can only pause to remark that flint like that of Brandon or Mildenhall must always have been in great demand.

Associated with the flint tools at the Lincolnshire settlement, we have found iron slag, and there are marks of ancient fires in many parts of the heath. The ironstone may have been obtained from the shales and limestones of the Lower Lias at Scunthorpe, a few miles distant. Now, the conclusion which we draw from the presence of the slag is, not that the pigmy flints were fabricated during the Iron Age, for there is no sign that the objects are coeval, and the constant movement of the sands would suggest that the contiguity is due to after disturbance ; the true reading of the facts seems to be that there was successive site occupation until far into the Iron period. Within the memory of old people, part of the waste was under the plough, although, for centuries, a few scattered houses have apparently been the only habitations.

Surveying all the facts, we think that the dwelling-places and factories on the gravels and sands are generally of late Neolithic Age, and we have cited examples external to Surrey because they seem to lend a key to the old occupation of the Surrey heaths. In practically every case where the materials were equally good, the workmanship of the sand implements is more delicate and has better finish than in those of the chalk. We associate the former tools mainly, though not entirely, with the Goidels, who, having introduced bronze, would continue nevertheless to use flint as well; the latter specimens we connect with the Iberian, or Neolithic men proper. Arrow-heads in South-West Surrey, minute awls and piercing instruments on a Lincolnshire heath, circular cutting tools of the Suffolk warrens, these are the gems which one finds in the arenaceous districts. The makers of these appliances had needs somewhat different from those of the hill-folk. Hares, rabbits, and game birds did not require such heavy weapons as the larger beasts of the Iberian chase. The agricultural system, the nature of the soil, other modes of fishing, the development of useful arts, demanded hoes, spades, fish-hooks, borers, saws, and lancets of a more finished kind. If the hungry heath itself were not worth cultivating, there was usually a loamy soil not far away, composed of the rain-wash from neighbouring geological strata. Crude ideas of sanitation would begin to present themselves. The excellent drainage must have compelled attention. In our times, the alluvial soil of Surrey and Kent is said to give wealth without health; the chalk downs, health without wealth; the Greensands, health and wealth. Some inkling of these truths may have been discerned by the old settlers. Besides all these considerations, the gorse and heath would furnish plenty of material for roofing the pit dwellings, to say nothing of the demands of the camp fires. We think we have detected marked differences in the tools in such closely neighbouring spots, near the Little Ouse, as Grimes Graves and Morley's Clump on the one hand, and Santon Warren on the other.

To sum up, we consider that the sandy situations may have been selected by the later Iberians, but that they were chiefly the settlements of the Bronze (Goidelic) people, who used bronze and stone alongside each other.[5] Canon Greenwell thinks that flint arrow-heads were employed in the period of highest cultivation in the Bronze Age. No arrow-heads of bronze have been found in Britain; he therefore infers that flint remained in favour for these weapons. On the other hand, spear-heads and javelin-heads, which were commonly retained in the hand, and were less liable to be lost, were made of bronze, and rarely of flint.[6]

Locations on the sand are mostly at a lower level than the supposed earlier ones on the chalk, though not always, for Anstiebury has an altitude of 775 feet, and Leith Hill is actually Surrey's loftiest peak, being 967 feet above the level. Even with the occupants of sandy villages, then, we see that defence was a problem to be faced. But it seems to have been a secondary consideration. If the soil were desirable for dwellings, stock-rearing, and tillage, and if the water-supply were abundant, it was well ; if, in addition, the post was impregnable, so much the better.

CHAPTER XIV.

THE NEOLITHIC IMPLEMENTS OF THE SURREY CORNER.

(3) The North Downs: Riddlesdown and Woodcote.

Riddlesdown, it will be remembered, is on the line of the suggested British trackway from Cardinal's Cap, Caterham, to Croydon. Commencing with the ancient fort, we think we have succeeded in tracing this track Northward over Tillingdown, through Warlingham, Riddlesdown, and Selsdon, to Croydon. In the neighbourhood of Riddlesdown appears to have been one of the most considerable of the sites or residential camps in this corner of Surrey. A large portion of these picturesque heights is now covered with a thin turf resting on chalk rubble, and occasional small plantations and small groups of yews, firs, and hollies. On one side is the wooded hill, with bare patches of Oldhaven pebbles, known as Croham Hurst, while on the other, across the waterless valleys of Kenley and Caterham, are the typical rounded, billowy, undulating chalk hills. While meditating on these hills and valleys, the ancient sea-beach of Oldhaven pebbles and the distant town of Croydon, one is naturally reminded of the lines of Tennyson :

'There where the long street roars, hath been
The stillness of the central sea.

' The hills are shadows, and they flow
From form to form, and nothing stands;
They melt like mist, the solid lands,
Like clouds they shape themselves and go.'

On the surface of the thin turf a few rough flakes, weathered white by exposure, may sometimes be found, while towards Upper Warlingham and the poetically named 'Whyteleafe' the diligent seeker after flint implements may, at times, find something worth his trouble. Here the fields are carefully cultivated for the production of corn and vegetables, and in several places are artificially banked up over the escarpment. Where not so banked, the soil is white with chalky rubble and flint, and seemingly valueless for systematic cultivation. Whether these terraces are modern or not is uncertain, but there are reasons for thinking that they are of Neolithic date. That this was a Neolithic site seems clear. Among other evidence, is the number of implements which we have found, and of which we shall speak later on. As the turf on the neglected portions of these downs lies close on the chalk, separated by a few inches only of cretaceous mould, while on the other parts there is a considerable depth of tilth, we may assume that agricultural operations have been in progress for a very long period. The evidence for an ancient system of agriculture seems to rest upon the fact that the implements are now annually turned up by the plough in the places most cultivated and are rare on the other parts. Had they been originally left on the thin turf and covered in recent times only, the majority would be found weathered white like those on the surface. It might also be stated that there are several shallow pits or depressions, lessened in depth by time and agricultural operations, probably used as shelters or as places for obtaining flint.

Heavy flakes, often showing signs of use, of a brownish flint, stained at times by iron through contact with harrow and plough-share, are most common. Smaller flakes and knives may be seen, of a dark indigo tint, many being nicely trimmed, so little resembling the local flint that we are inclined to think the material was brought from a distance. Many of the flakes are long, thin and delicate, some apparently pointed at the end as if for some definite purpose.

One of the knives which we found is of duckbill shape, particularly thin and almost transparent. Pot-boilers are fairly plentiful. Many are white and of rounded shape, and marked with the usual miniature mosaic-like pattern, but the majority are of the common grey colour and of roughly cubical shape. Several good hammer-stones, showing signs of flaking as well as of battering, were found close together in one field. Another field has furnished several small rounded scrapers of different colours, the best being of the foreign indigo tint. Cores are above the average both in number and finish, one little gem, of the same bluish flint, being specially worthy of mention. A discovery of exceptional interest was a celt four inches in length, of grey colour and rather peculiar shape. It appears to be of a late and rather unusual type, though the flaking does not suggest the later Neolithic style. The flakes removed were of large size, two of them on the flattened face having been detached longitudinally. Although of good shape, it is not, in Sir John Evans's words, 'minutely and systematically shaped,' and perhaps its maker intended to grind and polish it into some orthodox kind of small celt. We do not

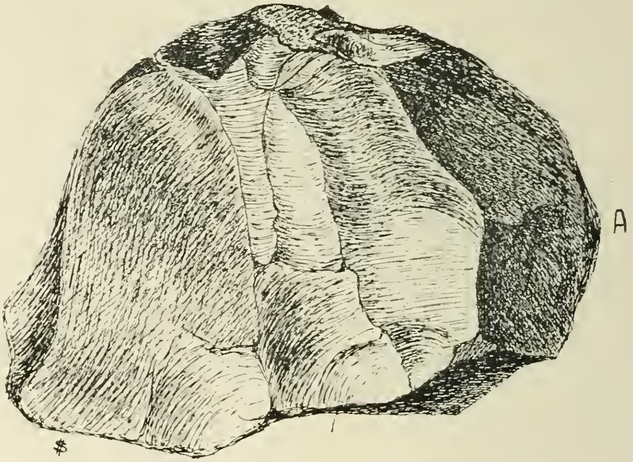

Fig. 12.—*Hammer-stone, or Pounder* (*Riddlesdown*).
(Natural size.)

remember seeing an implement exactly like this in any museum or figured in books. Another celt, or pick, 4½ inches long, slightly curved and much stained with iron oxide, was found in a neighbouring field. This one is cleanly and neatly chipped, and is altogether a good specimen of the commoner kind of surface celt.

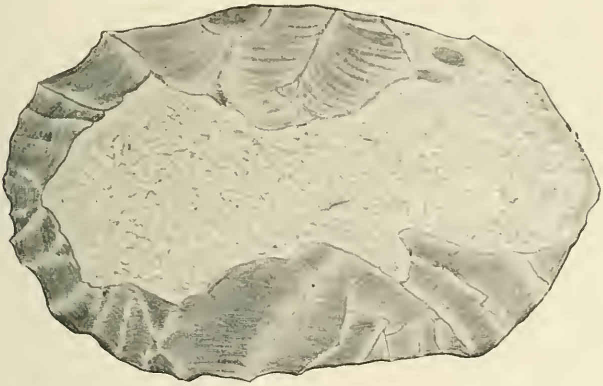

Fig. 13.—*Oval Knife* (*Riddlesdown*).
(Twice natural size.)

The best knife from this district is probably the oval specimen (Fig. 13). It is slightly curved and finely worked all round the edge of the convex face, with the exception of a small part at the bulb end, leaving a small portion of the outer crust in the centre. It is also worked on the left side of the smooth or bulb face in order to procure a fine cutting edge. The fabricator (Fig. 14) is made from the local brownish flint and much stained with iron oxide. A narrow strip of the outer crust has been left on the upper face, which

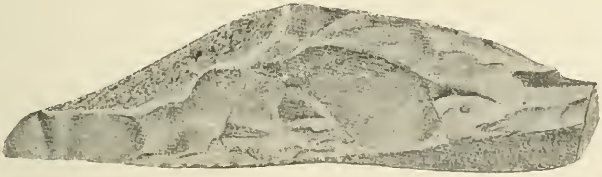

Fig. 14.—*Fabricator, or Trimming Implement* (*Riddlesdown*).
(Natural size.)

has been carefully worked. This useful and rather rare type of implement was made from a thick prismatic flake, and is slightly curved longitudinally.

Only one weapon has been found by us in this district which in any way resembles the orthodox type of arrow-head. This is roughly leaf-shaped, of dark flint, slightly retouched on the flat face, and boldly worked on the other. The point, which is slightly curved, is worked to a fine edge, and, although some collectors would style it a borer, we think it might be classed as an unfinished arrow-head.

Across the streamless valley of Purley we reach the heights above Waddon and Beddington, leaving the town of Croydon on the right hand. In some places rough flakes and chips are rather common, and we have succeeded in finding several good scrapers of the rounded and duckbill varieties. The best one, which was fashioned from a thick flake of bluish mottled flint, is neatly worked and finished. There are indications that the hollow on one side was made at a later date than the implement. It was apparently used first as a hand tool and subsequently fastened to a wooden handle. A white rounded scraper and a 'duck-bill' resemble in form certain implements which we found during the same season on the High Down in the Isle of Wight.

About a mile Westward is Woodcote, well known to antiquaries as one of the supposed sites of the Roman camp or town of Noviomagus. Many differences of opinion exist, or at least have existed, as to the exact position of this Roman settlement. Some antiquaries favour Holwood, near Keston, in Kent, where there is an undoubted camp, while others put forward the rival claims of Crayford, Carshalton, Beddington, and Farley Heath. Antoninus, in his 'Itinerary,' written probably about the year 120 A.D., mentions Noviomagus, and gives it as 10 miles from London on one of the roads leading from that city to Richborough. About 18 miles from Noviomagus was Vagniacæ, which was, probably, Southfleet or Maidstone, and nine miles from that place was Durobrivæ (Rochester). Manning and Bray, in their 'History of Surrey,' tabulate the arguments for and against the different supposed sites, and find that Woodcote agrees best with the distances given. They say, 'That Woodcote was a camp or town there can be no doubt; perhaps it might be the former, the town being at Wallington below it. The greater part of Roman cities were not placed on eminences but in their vicinity, where large camps were formed for protection.' A personal visit was paid in the year 1811 by Manning and Bray, and the information was obtained that there were originally three 'wells' which had been filled up. These were considered to have been storehouses for grain. After a careful study of the whole question we feel inclined to agree with Manning and Bray's view, and would add that the Romans in this place merely adapted an old British site, as at Silchester and in other districts, and that the site had been previously a Neolithic settlement.

Woodcote is situated about 400 feet above sea-level. Southwards, at the base of the chalk escarpment, along which the new Chipstead Valley Railway enters a fossiliferous section of the Middle Chalk (*Micraster præcursor* and *Holaster planus* zones), is Smitham Bottom, and in the distance one can see Farthing Down, with its Saxon tumuli. On the side sloping towards Wallington, situated amidst beds of lavender and peppermint, the fields are strewn with the olive-coated flints found at the base of the Thanet Sands, which formation, considering the proximity of the Beddington outlier, we may assume once covered this district. These sands consist chiefly of grains of quartz derived from the disintegration of crystalline rocks. At the base of the Thanet Sands, says Professor H. G. Seeley, which is exposed very well at Charlton, and all along the valley of the Thames, there is seen resting immediately upon the Chalk a band of flints, unworn, rather small compared with those in the Chalk below, green-coated, embedded in a sand formed of the green mineral glauconite, with a certain amount of Chalk or marly matter, which may make up a foot or two in thickness. On the denuded chalk of the Southern slope there is an abundance of fractured white flints, but very few show signs of artificial treatment. Near the summit of these downs is a somewhat curious depression, possibly the effect of sub-aerial denudation, but more likely caused by extensive digging, at no great depth, for flint. The natural causes of a few thousand years, aided by more recent agricultural operations, would be sufficient to obliterate all traces of such excavation. But whatever the explanation of this feature, it seems fairly certain that there once existed near this spot either a considerable Neolithic settlement or a working site. On our first visit we found, in addition to many rough flakes, the end of a celt and a well-worked arrow-head. The latter implement (Fig. 15) is of rather large size and dark blue material, with a vein of a lighter and perhaps more crystalline nature towards the pointed end, where it is unfortunately broken. Later on we discovered the beautifully shaped and finished fabricator of white flint (Fig. 16), which, to use the words of Sir John Evans, is 'as carefully wrought into form as any flint hatchet or chisel.' Near it was a nicely-worked crescent-shaped scraper, or perhaps skinning-knife, of a light-bluish material, notched at each end for insertion and binding in a wooden frame or handle for use horizontally.

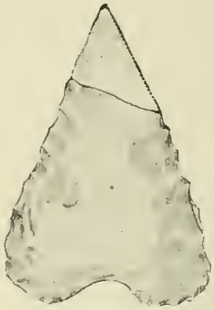

Fig. 15.—*Arrow-head* (*Woodcote*).
(Natural size.)

The fabricator, or arrow-flaker (Fig. 17) is much smaller than the above-mentioned specimen, of somewhat similar type, and is distinctly curved. It is of a mottled blue colour, and carefully worked into its rather peculiar form. One side is more convex than the other, and this fine little implement shows all the signs of that bruised appearance noticed by Sir John Evans in his description of a fabricator from Bridlington. Besides the arrow-head already referred to from this district we found a fine arrow- or lance-head. It is roughly leaf-shaped, neatly worked on both sides, and is, we are informed by one of the best authorities on this subject, of a rare type. In this case the broader end was evidently the cutting or piercing edge, the weapon being of a kind and size suitable for employment against large game.

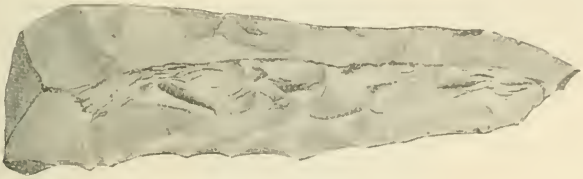

Fig. 16.—*Fabricator* (*Woodcote*).
(Natural size.)

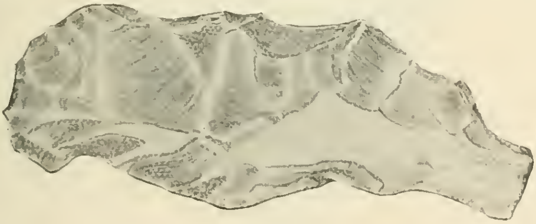

Fig. 17.—*Arrow-flaker* (*Woodcote*).
(Twice natural size.)

In addition to the numerous implements of Neolithic age, we were astonished to find at the top of these North Downs, several miles from any present river valley, an undoubted Palæolithic flake knife of light ochreous colour and a beautiful pointed implement of the best cave or river drift type (see Fig. 18). The colour is creamy or yellowish, with faint blue markings. It is somewhat difficult to account for the presence of these Palæolithic implements among the relics of Neolithic man. Sir John Evans mentions some pointed implements from Cissbury and Dunstable, and says, 'Judging from shape alone, they might be regarded as being of Palæolithic age, but their surroundings prove them to be Neolithic.' Here the specimen seems much more Palæolithic in shape than those he pictures, and, in addition, there is the evidence supplied by the undoubted Palæolithic knife, which is rounded and coloured. Now that the evidence seems to favour the theory of the continuity of early man in Britain, some authorities would probably place it in the Mesolithic period. We feel inclined to think that it is of true Palæolithic age, but, unlike its numerous fellows of the same period, it certainly has not rested for centuries among the brown and yellow river gravel or on the sealed cavern floor. It was perhaps dropped by some early drift man

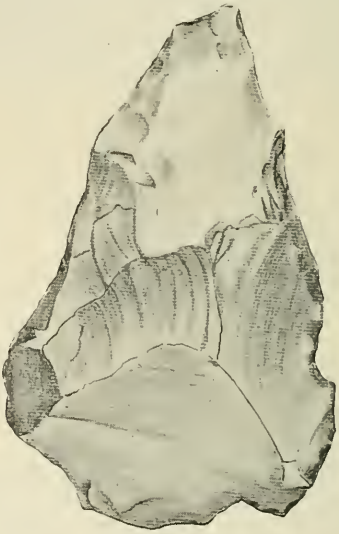

Fig. 18.—*Pointed Implement—? Mesolithic* (*Woodcote*).
(Natural size.)

during the fierce pursuit of food or fellow, a few miles from his home in the Wandle Valley, to be lost sight of for thousands of years in the clayey covering of the chalk of Woodcote, until its discovery in the first year of the twentieth century. Or it is possible that it may have been found by the Neolithic hill-men and treasured by them as a curious relic of their Palæolithic predecessors.

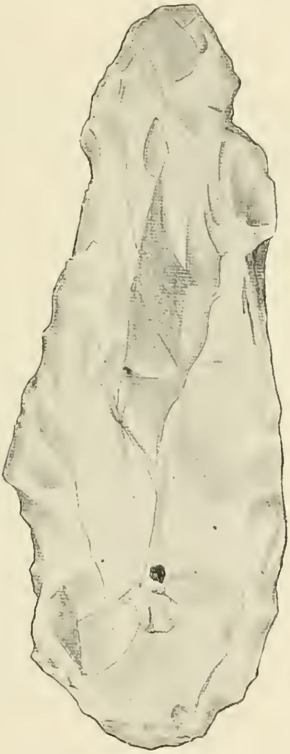

Fig. 19.—*Celt* (*Woodcote*).
(Natural size.)

In addition to the above-mentioned exceptional finds, we have added to our little collection several good cores, knives, borers, scrapers, and a heavy, roughly-worked celt. A core, or nucleus, of white flint with bluish veins, is one of the best we have ever seen, being almost perfect in the neatness and regularity of the flaking. One of the rounded scrapers, or, it is likely, strike-a-lights, is of a fine, lustrous dark blue, made from a particularly beautiful piece of flint. It is carefully cut after the style of the modern diamond, with a square facet left in the centre, the bulb side being, of course, smooth. Another is a pretty little rounded specimen of light flint, neatly bevelled at end and worked along the left side. On one of our last visits to these fields we found, besides the average number of flakes and rough scrapers, a very neatly-shaped short 'duck-bill' of black flint mottled on the under side and a curious half-moon shaped little implement of a light colour and nicely worked. Its shape is probably due to a later fracture, and it may have been originally either a spear-head or merely a thin round scraper. We also added to our collection a really excellent specimen of a chipped celt about 4 inches in length, and very slightly curved. It is thinner and more graceful in outline than the ordinary kind of celt, and tapers gradually from its tongue-shaped cutting edge to the butt-end (Fig. 19). Perhaps, however, the rarest discovery in this locality was the broken end of a polished celt, which had been cleverly manipulated so as to form a kind of chopper, with a shank or handle—'*un véritable manche*,' as De Mortillet might have called it.

CHAPTER XV.

THE NEOLITHIC IMPLEMENTS OF THE SURREY CORNER.

THE NORTH DOWNS (*Continued*): WOODMANSTERNE, HEADLEY, AND BANSTEAD.

'IN the Neolithic Age savage warfare did I wage.' Thus sings Mr. Rudyard Kipling in a poem which, with a little poetical licence, as far as we can gather from the phrases 'mammothistic etcher' and 'dim red dawn of man,' refers to the Palæolithic period. It might be noted, by the way, that this blending of the two great Stone Ages is not altogether confined to the popular poets. One is reminded of this line when enumerating the Woodcote weapons. Mr. G. Clinch, in the interesting paper already quoted, published in the *Journal of the Anthropological Institute* in the year 1899, thinks that, 'judging from the evidence of the implements and from the character and amount of wear to which they have been subjected, it seems probable that the race who used them—the men and women living in the neighbourhood of the Kent and Surrey border in the Neolithic period—consisted of people of pacific occupations, tillers of the soil and herdsmen.' The presence, however, of the weapons before mentioned seems to suggest 'savage warfare,' or, at least, the hunter's life. Less than a mile Westward from Woodcote, in the direction of Woodmansterne, we found another relic of the combat or the chase in the shape of an axe-head. This is white in colour through long existence in a porous soil, and in form is rather peculiar for Neolithic times. From the length of the flakings and the neat little workings at the edge, we do not think it belongs to the earlier age. In the same field were several good flakes, a neatly-pointed awl or borer of small size. two double-hollow scrapers, and a rather large 'duck bill' of blue flint.

Leaving on the right the distant woods of Barrow Hedges with two small tree-crowned heights between that point and Woodcote, which perhaps were in the track of the Roman road, we pass fields of lavender, peppermint and camomile. According to the natural history lore of Shakespeare and his day, the more you tread on the camomile the stronger it grows, but as the modern cultivator has little sympathy with this old-world sentiment it is advisable to walk warily. Near one of these fields we found a peculiar pointed implement of white flint, nicely worked on one face only, as if the worker had started to fashion a long, narrow spear-head. Considering its unfinished state, it would probably be safer to call it a fabricator.

Nearer Woodmansterne we have found, in addition to several nicely-shaped flakes and knives, at least three round scrapers of dark flint and several of the 'thumb' and 'duck-bill' varieties, one of the latter being longer and more curved than is usual. Most of these small tools show signs of neat working or of use. The small javelin-head (Fig. 20) is made from a triangular flake with double half-cone-like bulb, trimmed at the edges and carefully worked at the point. Another small knife, or, probably, arrow-head, is the pointed end of a thin flake neatly worked at each side and at the point, but untouched on either face. It shews the central ridge of the flake from which it was made, which ridge divides equally one face like the rib of a leaf (Fig. 21). We found also a small saw and a triangular flake with single tang of a rich blue-veined flint. The latter shews no sign of secondary working, though as regards material and shape it might have been easily made into an arrow-head. The celt (Fig. 22) may be considered our best discovery in this neighbourhood. It is a fine specimen of the chipped and polished implement, in colour creamy white with a dark patch where the material is slightly different in character, and with a few iron streaks. The length is 5 inches, and the broad end is, of course,

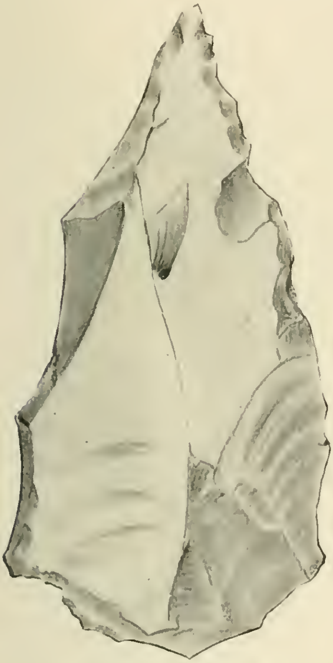

Fig. 20.—*Javelin-head* (*Woodmansterne*).
(Twice natural size.)

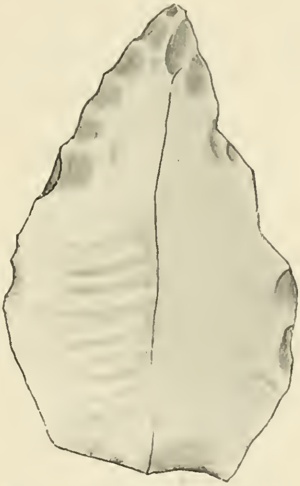

Fig. 21.—*Triangular Knife* (*Woodmansterne*).
(Twice natural size.)

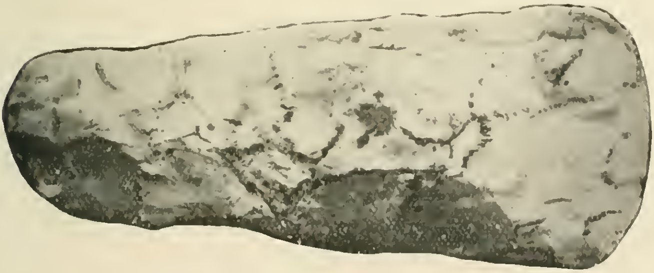

Fig. 22.—*Celt* (*Woodmansterne*).
(From a photograph.)

ground and polished, the cutting edge being still keen, while on one face, which is rather more convex than the other, the projections have been ground down. Altogether it is one of our best finds in this corner of Surrey, a district, we believe, in which this class of implement is by no means common.

Woodmansterne Church, according to the Ordnance Map, stands over 400 feet above sea-level, and from one side, at least, holds a commanding position. Probably here, as in other parts of Britain, the Christian Church succeeded the pagan temple, which, in its turn, followed an ancient British camp or settlement. In the neighbourhood, the soil on the higher ground seems to have been seriously cultivated for a considerable time, if we may judge from the thickness of the tilth. Down the slopes, on the contrary, the surface is often white with chalk rubble and bleached flints, while the valleys, as in Hungry Bottom, are partly covered with the clay, produced by the decomposition of chalk. Perhaps the light soil is constantly washed down by the rain, or the slopes have been but recently in process of cultivation. Readers of Darwin's studies on the earthworm will remember his reference to the difficulty encountered by the worms in working on the bare chalk, and how their efforts are weak on certain soils, until man, or the denuding forces of nature, or both combined, can give these creatures a start. In woods their influence is but slight, owing to the fact that the decomposed products of the fallen leaves are unpalatable. We have noticed that in certain woods, after a fire or strong wind has bared a portion of the ground, the flint implements lie on the original surface, their only covering for centuries having been the leaves. Around this district are several pits from which probably the flint was obtained by Neolithic man. They are much overgrown and several contain large trees, and there is apparently no evidence that they have been used in recent times. It is possible that the smaller pits may have served as pit dwellings. Near one, at least, chips, flakes and rough cores are very plentiful. Many scattered yew-trees, 'with their thousand years of gloom,' the remains of the old pilgrim paths, sometimes in rows of three or four, still crown these chalk ridges. In the lines of Wordsworth, they stand as they

> 'Stood of yore ;
> Not loth to furnish weapons for the bands
> Of Umfraville or Percy ere they marched
> To Scotland's heaths ; or those that crossed the sea
> And drew their sounding bows at Azincour,
> Perhaps at earlier Creçy, or Poictiers.'

Across a pleasant wooded valley or 'bottom,' and at the top of a long and picturesque lane sunken in parts many feet below the fields and laying bare the roots of beeches, lies the old-world village of Chipstead. It overlooks the Brighton road, with Gatton Park, and the Lower Greensand ridge in the distance, towards the right. Few places comparatively near London are as worthy of frequent visits as this pretty village, with its fine old church retaining still its five beautiful Early English lancet windows and quaint side doorway of Transitional Norman date. Our numerous visits here at all seasons of the year, though full of pleasure and profit, geologically and botanically, have not been too successful with regard to traces and relics of prehistoric man. We have, indeed, found a few rough flakes and scrapers, one neat little knife, a crude adze made from a heavy flake and a small round strike-a-light of 'Kentish grey' flint neatly worked at the edge. The last article is of peculiar interest in that it greatly resembles, as regards shape and colour, the specimen labelled 'Neolithic strike-a-light' in the Jermyn Street Museum. Certain good authorities inform us that there is no evidence of the existence of a Neolithic strike-a-light of this shape and that in all probability it is of much more recent date, the position of the bulb being exactly similar to that in modern work.

'Though I have now travelled the Sussex Downs upwards of thirty years, yet I still investigate that chain of majestic mountains with fresh admiration year by year ; and think I see new beauties every time I traverse it.' So says Gilbert White of a portion of the South Downs, and though we cannot claim an acquaintanceship of thirty years with the North Downs, they have been familiar for half that time, and we still investigate them not only for the birds and flowers dear to the old naturalist, but also for relics of an early race to him unknown. We are now reaching a district, namely that of Leatherhead, Box Hill, and Betchworth, which may well be compared to the 'majestic mountains' of his eulogy.

To the South of the Roman road which runs from Leatherhead over Epsom Downs lies the village of Headley, known to all lovers of picturesque Surrey. This part is more thickly wooded than is usual on these rounded downs, and one almost misses that bareness which to many persons adds a charm to the graceful contours of the chalk country. Headley Church stands on one of the numerous groups of Eocene outliers, its spire being a conspicuous figure in the pleasing landscape. The height of the Eocene Beds is here about 600 feet above sea-level, the strata consisting of Thanet Sands covered with typical sections of the Woolwich and Reading Beds. On the heath are clays and sands of considerable thickness, but of later and somewhat doubtful age. They are still a puzzle to geologists, though Prestwich considered they were probably of the same age as the Lenham Beds which he traced at Chipstead and Netley Heath.

On the roadside heaps of stones collected from the fields we have occasionally found a few rough specimens of an inferior kind of flint. Near the heath, the flints, probably of Glacial Age, which lie on the top of the sand, are of better material and more suitable for working. Neolithic man, apparently, soon discovered this fact, for on one spot we found evidence of the manufacture of a considerable number of implements. Flakes and cores were numerous, many of the former being very small and neat, while others were large and rough. After several visits and careful searching we succeeded in getting several finished tools and weapons, of which the best are described below. The implement (Figs. 23 and 24) is of a rare type and is one of the most interesting specimens recently discovered in this part of the country. It is of light grey flint with a very fresh appearance, and though generally lustreless, it has several patches of bright polish. The freshness and dulness of tone are perhaps due to the fact that it had rested undisturbed on the gravel and sands under the thick peaty turf. Judging from its form, which is tongue-shaped at the beautifully finished working

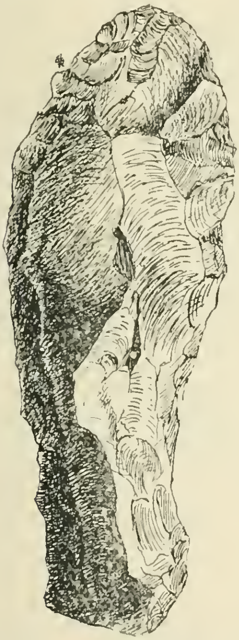

Fig. 23.—*Celt, Hoe, or other Agricultural Implement* (*Headley*).
(Half natural size.)

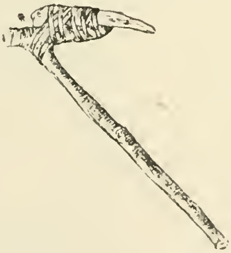

Fig. 24.—*Suggested Mode of Shafting Hoe.*

end, while the other is fashioned into a roughly squared handle, we are inclined to think it was a hoe or some similar agricultural implement for use in the hand. Fig. 25 is another rather rare type of celt with a chisel edge formed by a single transverse facet. It is of a grey material with occasional blue shadings, and is in general roughly flaked, though one face is carefully worked near one of the sides. Some of the original coating is left on the rougher face, and evidently the material proved of a rather intractable nature and failed to do justice to the skill of the worker. The scraper (Fig. 26) is of the same greyish colour and dull polish as most of the flakes and tools from this place. It may be classed as one of the 'oyster shape' patterns, and its rounded edge is finely and carefully bevelled. A small portion of the crust is left in a slight hollow at a convenient spot for the thumb. We have also found here a rolled pebble with a shallow groove chipped round the middle. Stones of this pattern were, according to Sir John Evans and other authorities, hafted for use as hammers, and some were used as 'sinkers' for nets. In our specimen the groove is very shallow and appar-

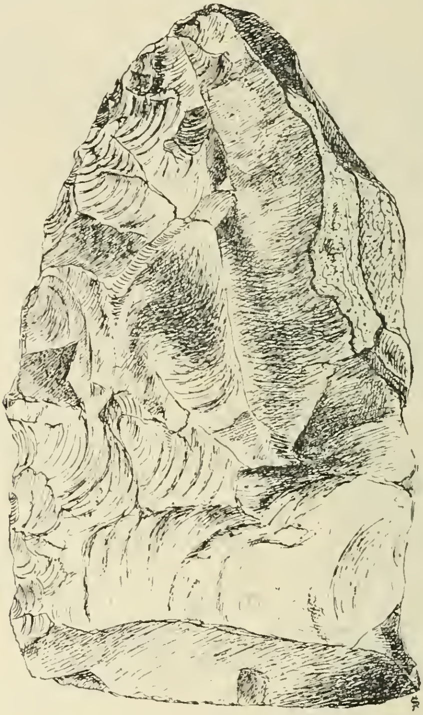

Fig. 25.—*Axe* (*Headley*).
(Natural size.)

ently unfinished and the ends show no sign of battering, so that it was perhaps a rough sinker for use in some Neolithic pond or lake, or in the river Mole at the foot of the Chalk Downs.

Among the small flakes mentioned above were many tiny chips, which apparently represent the refuse of the axe-maker's finer work. A large proportion of all the flakes on this spot were as keen at the edges and altogether as fresh in appearance as when they were struck from the core. Mr. G. K. Chesterton, in a recent volume of clever essays, illustrates his pretty paradox that 'badness is merely relative' in the following humorous manner. There is, for instance, no such thing as a bad knife, he contends. The article we consider bad would have been prized by Neolithic man. We are inclined to maintain that many of the modern blades whose blunt edges successfully defy the energy of the itinerant and needy knife-grinder would prove but sorry substitutes for the keen-edged flakes of Headley.

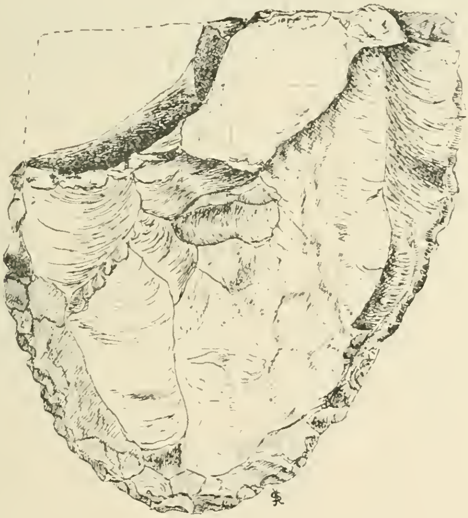

Fig. 26.—*Scraper* (*Headley*).
(Natural size.)

Lying close to the side of a freshly harrowed field near Tot

Hill we were fortunate enough to see the pretty little knife of rosy hue which is pictured in Fig. 27. Near the place where we discovered the fine celt or hand-hoe above mentioned, we recently found the small single-barbed arrowhead (Fig. 28), which is carefully chipped along the edges, but is practically untouched on the faces. A friend on the same occasion picked up a black oval scraper boldly worked from a short thick flake. On the succeeding visit to this rather remunerative place we were surprised to see in some recently disturbed coarse gravel certain fragments of pottery, surrounded by numerous pot-boilers, several good flakes, and the broken end of a fabricator. The bottom of the vessel, which was in two pieces, contained several small bones, white and friable, but showing no signs of the action of fire. The overhanging rim was complete, though fractured, and by piecing the portions together we have obtained the vessel carefully drawn and somewhat idealised by Mr. Harrowing on p. 162 (Fig. 32). In shape it resembles one of the so-called 'cinerary urns' of Neolithic times, but from the presence of the numerous pot-boilers and the condition of the bones already referred to, we thought at first that we had discovered one of the vessels in which the ancient inhabitants

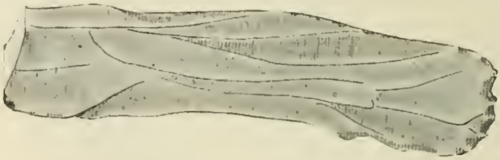

Fig. 27.—*Knife* (*Headley*).
(Natural size.)

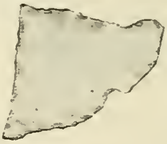

Fig. 28.—*Single-barbed arrow-head* (*Headley*).
(Natural size.)

(Bronze period) of this sandy tract on the North Downs cooked their precarious dinners. The bones have, however, been pronounced by one of the best authorities to be human, and it is possible to account for their non-calcined condition by the fact of a hasty, and, therefore, incomplete, cremation.

In Mr. Watts Dunton's powerful story of 'Aylwin' is a slight description of an amateur geologist and antiquary whose hobby was 'the harmless quest of flint implements.' We have endeavoured to show that this corner of Surrey offers a happy hunting-ground not only for the pursuit of this 'harmless quest,' but also for the more extensive study of geology and its fascinating problems. Besides the inexhaustible treasures of the chalk and the numerous outliers of Tertiary Age, many fossils lie scattered about the fields, chiefly pseudomorphs released from the broken nodules of flint. In the course of our rambles we have picked up many specimens of echinoderms; such as *Echinoconus conicus*, *Micraster cor-anguinum*, and commonest of all, *Echinocorys vulgaris*, popularly known as the 'shepherd's crown.' The pretty little brachiopods, *Rhynchonella* and *Terebratula*, are sometimes to be seen, though more rarely, and, of course, there are numerous sponges. On showing one of the echinoderms one day to a labourer near Banstead Downs, he immediately supplied us with the local name, and added that he had found many a 'thunderbolt' in his time. Being aware that the celt is known by this name in most counties, we listened attentively in anticipation of the production in the neighbourhood of a polished axe. We were for once doomed to disappointment, for the 'thunderbolts' of this Jove were, we soon discovered, merely the fossil belemnite. Then we remembered that not only the celt but the belemnite—the partly internal, pencil-shaped guard of an extinct cuttlefish —and the rounded lumps of iron pyrites were also known to country people as thunderbolts. It is to one of these that Shakespeare refers in the beautiful dirge from 'Cymbeline':

> 'Fear no more the lightning flash
> Nor the all-dreaded thunderstone.'

We had but recently returned from Brittany, and thought of Mr. Clodd's remark about the travelling umbrella-mender in that interesting country, 'who asks on his rounds for *pierres de tonnerre*, and takes them in payment for repairs.' This must be a profitable business if the prices realised approach those asked by certain dealers. To both the Greeks and Romans the polished axes were known as 'thunderbolts,' and in later times many ingenious guesses were made as to their origin. By a peculiar method of reasoning common with primitive peoples, the celt, being in their minds intimately connected with thunder, came to be regarded as a protection against lightning. In Cornwall and parts of Scotland celts are still carefully preserved in the cottages as simple substitutes for the lightning conductor.

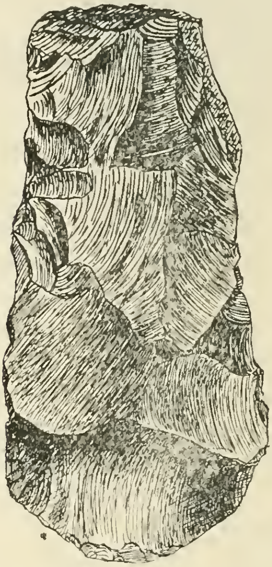

Fig. 29.—*Chisel-celt, Front View* (*Banstead*).
(Natural size.)

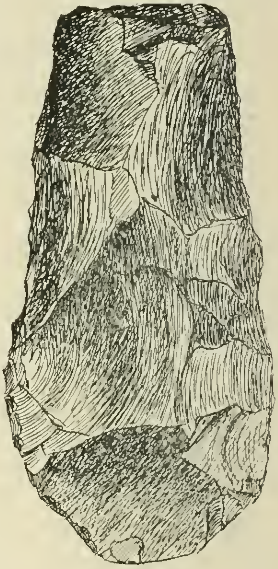

Fig. 30.—*The Same, Back View.*
(Natural size.)

Though, as already noticed, we have been fortunate enough to find a polished celt at Woodmansterne, we have, as yet, been unrewarded in this respect at Banstead. We have, however, found two rather roughly-chipped celts and a fine chisel (see Figs. 29 and 30). The chisel is of a type by no means common. It is 3 inches in length, of a rich brownish colour, with a good lustre. The implement seems to suggest bold yet careful workmanship, and one face is flatter and has smaller workings than the other, while the cutting edge is formed by apparently single transverse facets on each face. Within a few weeks of finding this we picked up a smaller chisel of similar shape about a mile distant towards the valley of London Clay. In a previous chapter we have referred to the fine barrow named Tumble Beacon, and also to the recently desecrated barrows on Banstead Downs. On the Downs we have found merely a few small flakes, and, considering the absence of bare spots on these turf-clad heights, this is not astonishing. Our best discoveries were made in a field not far distant from the Tumble Beacon tumulus, on a spot which was evidently the camp or working site of the Neolithic inhabitants of this district.

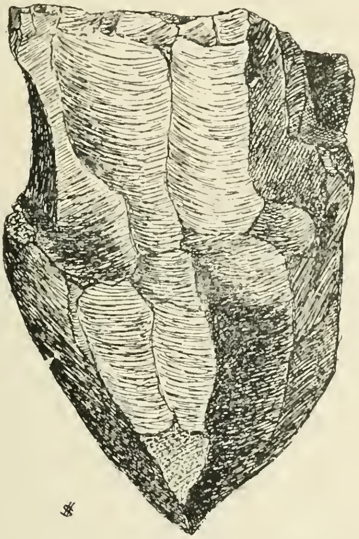

Fig. 31.—*Core, or Nucleus* (*Banstead*).
(Natural size.)

Besides the two celts and chisel already mentioned, we have found several good cores, including the implement-looking core (Fig. 31). This is of bluish flint with grey spots, and the flakes appeared to have been detached with no little care and skill. Another core, or, more likely, sling-stone, has a peculiarly varied light and dark blue patina, is roughly egg-shaped, and worked all over. Knives and scrapers are fairly plentiful, most of them being small in size and neatly fashioned, and many of them evidently made from the rounded Tertiary pebbles so numerous on many parts of the North Downs. One is a nearly circular scraper of grey flint with boldly bevelled edges. We have also two good awls or borers, one especially being neatly and finely pointed.

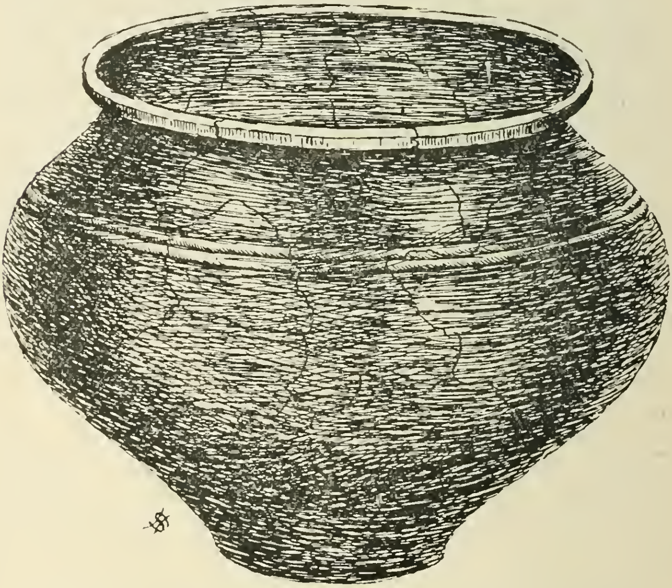

Fig. 32.—*Urn* (*restored*) *of Coarse Earthenware* (*Headley*).
Actual size, 9 inches deep, 9 inches across mouth, base 4½ inches.

CHAPTER XVI.

THE LESS FAMILIAR TYPES OF NEOLITHIC IMPLEMENTS.

THE beginner in the fascinating pursuit of book-collecting often directs his aim to the acquisition of first folios, tall copies, or rare editions of Elzevir or of Aldus, but with increasing knowledge of bookstall and auction room he becomes aware of the fact that there are many volumes of equal interest and rarity, although of less reputation in the world of bibliomania. The first desire of the collector of implements is to possess some of the finer specimens described and delineated in books, such as arrow-heads, polished celts, and the pointed tools of the drift. The novice attempts to find or purchase the leaf or lozenge-shaped arrow-heads found on the Yorkshire Wolds, the beautiful almond-shaped implements from Santon Downham, a polished Icklingham celt, or perhaps some fine specimen from the caves of La Madeleine or Solutré. At the dealer's he may possibly be successful, but his own searches will be, at first, rather disappointing. From field and gravel-pit he will fill his cabinet with natural curiosities, which, in the eyes of the uninitiated, closely resemble the productions of early man. Until he receives an 'object-lesson' from a fellow collector and masters the theory of the bulb of percussion and conchoidal fracture, and becomes familiar, by handling, with naturally fractured flints, his progress will be necessarily slow. When this practical knowledge has been added to his previously acquired geological and archæological lore, he will, if he is fortunate enough to live near certain river gravels or on the Chalk Downs, soon find his first rough flake. We well remember our first discovery on the Downs near Brighton of a triangular and particularly bulbous flake of dull blue colour, which in our ignorance we fondly imagined to be an arrow-head.

> 'Then felt I like some watcher of the skies
> When a new planet swims into his ken.'

We still treasure this and other early finds, and have still a decided partiality for the simple flake, whether flat or polygonal, even when it shows no sign of secondary working. It is as much the result of man's handiwork as the finished spear-head or Danish axe, while in shape and size there is infinite variety from the tiny narrow transparent pigmy chip to the broad and heavy flake of the river gravels. The chemistry of time has changed the original dull tones to beautiful shades, and between the white flakes of Cissbury and Grimes Graves and the jet-black ones of Walton-on-the-Naze the numerous colours defy description by anybody not possessing the trained and cultivated artistic eye. Often have we considered a rough flake worthy of preservation for its colour alone. We have experienced something of the difficulty Richard Jefferies felt in describing the colours of his favourite flowers, especially the tint of the May dandelion. There was no book, he contended, not even Chevreul's, which could tell him the different shades of yellow and gold and orange or scarlet. This difficulty is often met with when one attempts to describe the various tints which the flints assume after years of slow chemical or other changes. Even with the lighter or darker varieties we are reminded of the satirist's lines:

> 'And finds, with keen discriminating sight,
> Black's not so black, nor white so *very* white.'

From the long flake was fashioned most of the smaller tools and implements. The ideal flake would probably be divided into three lengths ; the thinnest or narrowest piece would be made into a knife, the middle, and usually superior, portion would be carefully worked into an arrow-head, while the bulb end, as the least perfect, might ultimately become a scraper. After a slight acquaintance with 'secondary working,' the novice will be able to appreciate the knives and scrapers, and will doubtless maintain his search until his eye is so accustomed to the slightest suggestion of artificial work by Palæolithic or Neolithic man that the rudest celt or scraper ever fashioned will rarely escape his notice. To those persons who really collect from field and pit and tumulus, and are not content with purchased specimens, it is doubtful whether the polished axe or ovoid implement afford as much delight as the finding of the smaller and less familiar types. Although we talk familiarly of knives, spear-heads, and scrapers, of course it is not always exactly known, in spite of the information obtained from modern savages, for what purposes the several implements were adapted. The flake was put to many uses, and it was not until late times that the several types were differentiated. It has often been pointed out that among so-called modern savages the same instrument serves different purposes ; for instance, the Fuegians use their arrow-heads for knives, and Kaffirs carve with their assegais.

The hollow scrapers used for rounding arrow-shafts and bone needles, or doing similar light work, are interesting little tools. Some have double hollows, *i.e.*, one on each side of the scraper for backward and forward work. Another small tool which we possess is of a very unusual type. One end is pointed as if intended for use in boring. The scraping or planing edge is well defined, and hollows are made for insertion of the index-fingers on each side of the angle or hollow.

Some scrapers, again, have a deeply-cut rounded notch not exceeding $\frac{1}{8}$ or $\frac{1}{4}$ inch in width. This kind was probably employed for smoothing bone instruments. There are also 'end scrapers'—long flakes with one extremity hollowed for scraping, and allowing considerable purchase to the fingers. The spokeshave pattern is also found. 'Combination implements,' comprising a knife, scraper, and one or more boring points, are not uncommon; they must have been the prototypes of the modern boy's knife, with its gimlet, tweezers, and screw-driver. Knives and saws with a projecting 'stop' are occasionally picked up, and 'rimers' for enlarging holes, supplementing the work of the ordinary borer, may likewise be discriminated from the usual types.

Awls or borers for making holes in skins or wood or in the teeth of animals for decorative and ornamental purposes, and in bark for use as floats in fishing, are often of triangular-shaped pieces of flint, neatly pointed at one end. Another specimen is of a rarer type and has its point worked out from one side, and is of a rich blue colour and fine material. In the lake dwellings, stags' horns are found, perforated with small sockets for holding the borers, but, judging by the shape, the men of the North Downs rarely considered it necessary to haft them.

Although knives in general cannot be regarded as unfamiliar, there are several types which are more or less uncommon. The triangular knives, neatly worked along two of the edges, which we have noticed at Woodcote, Woodmansterne, and other places, might well be accepted by other persons than the amateur as genuine arrow-heads. Though not of the orthodox pattern, they would be just as effective as weapons. In view of the rather remarkable fact that the elaborate and highly-finished arrow-heads favoured by collectors are very rare in this part of England, Mr. Clinch thinks that the simpler forms of pointed flint chips were employed.

Much discussion has recently taken place on the subject of 'sling-stones,' and the tendency now seems to be to class them under the general name of 'cores.' Many appear to be little more than the remnants of flint pebbles or nodules from which flakes have been struck off, but we think that others were deliberately fashioned into their present shapes for use in throwing, either in the hand or from a sling. We have also seen several specimens of a third variety which look not unlike the ends of celts or chisels, without any sign of fractures later than the flakings. They are still a mystery to us, and we can offer no better suggestion than the probability that they were used as wedges in splitting trees.

We might also refer to several interesting points not always noticed by collectors. The old and difficult question whether early man was right-handed or left-handed or ambidextrous, might, we are sometimes bold enough to think, be answered by a systematic comparison of a large number of hand tools. From the shape of certain knives, scrapers, and hammerstones in our possession, and the situation of the secondary workings, the implements appear to have been adapted for use in the left hand. In some, otherwise carefully made, a rather ugly portion of the crust has been obviously left in order to secure a better grip. Then, too, there are those which show signs of work of different dates, *e.g.*, the duckbill scraper referred to on page 142, which was originally used in the hand, and subsequently worked at the end and hafted. More rarely, one may find a portion of a polished celt thrown aside as useless, but afterwards retouched and converted into a useful scraper.

Even the smallest flake, especially if worked, found on some tumulus or camp, is to us more precious than the fine and occasionally suspicious-looking implements of the professional dealer, and there is the peculiar pleasure of finding what has been unappreciated, and probably unnoticed, for centuries, and one can give a special meaning to the words of the poet when he says :

'Pleasures newly found are sweet
When they lie beneath our feet.'

CHAPTER XVII.

THE PLEASURES OF 'FLINTING.'

FLINT implements are the relics of primitive man the most easily secured by the student. The search for these objects has its own delights, and the lessons taught by the implements discovered are too valuable to be despised, even by the veteran archæologist.

To write of the pleasures of summer 'flinting' is at once easy and difficult—easy, because then the lover of Nature sees nothing but lavishness and beauty; difficult, since amid such profusion he knows not what topics to select for description. The cycle spin to a favourite downland farm, the leafy lanes of elm and lime, the wealth of hedgerow and cornfield, the chorus of birds, as yet unsilenced by the July heat, the infinity of colours, so harmonious as to be but half perceived, save where the blazing poppy or yellow charlock almost hides a whole wheat-field, are distracting in their lure to the writer.

No, we will choose a sharp, frosty morning in mid-December, when sound and colour are less striking, and when, dare we confess, the fields are barer, and therefore, easier to inspect. We ride ten miles in the train, from which we step, feeling rather chilly. There is a sharp walk of three miles which will put that matter right. We make pauses to admire the old iron gates at Carshalton Park, soon, alas! to be carried away, and again to look at the weather-beaten walnut-trees above Wallington. The roads are hard, but we have put on our leggings, knowing what a thaw means to the tramper on the ploughed hill-tops.

We have reached a large upland farm, the buildings of which, embowered in a grove of a century's growth, form the centre-piece of a huge field. A one-field farm it might be called, for there are no arbitrary subdivisions by paling or hedgerow, except where a small home pasture is enclosed by high hawthorns. First, we must make a call on the good-natured farmer, who, unhappily, is a prisoner in his bedroom, racked with sciatica. After seeing the old man's pipe lighted, and hearing his talk become more cheery, we leave and get to business.

The field is known in all its features. One half of it will yield us comparatively little, but the remainder is large enough for many days' work. On the journey we have eagerly discussed certain questions. Will the ground be too hard to allow the specimens to be detached? We have a geological hammer, along with the lunch, in the knapsack. Has any of the land been ploughed and harrowed since the last visit? If so, it will not serve, until rain has washed clean the surfaces of the flints. Have those cabbages been taken up? Then there will be good sport, for the cultivation for this crop is fairly deep, and seems to reach the right floor. On arrival, each question is answered, and the day's quest settled accordingly.

Although we have walked this field dozens of times, and have here so often 'looked Nature in the face,' that we might be pardoned for thinking that we know the landscape like a book, there is something perennially new, and, at frequent intervals, we steal a glimpse at the foldings and carvings of the tablets of the earth's crust. Away to the East are the shingly ridge of Croham Hurst and the 'hog's back' of Riddlesdown, dear to the London beanfeaster. Further South are the heights of Upper Caterham, with the precipices of White Hill. At our feet the three valleys of Hooley, Caterham, and Chipstead converge towards the trough at Smitham Bottom, along which passes the fine cycling road to Redhill. The gently moulded forms of the separating ridges please the eye with their restful outlines. And those breezes, fresh from the Channel! John Evelyn, the author of 'Sylva' wrote in his diary, 'I will say nothing of the ayre, because the præ-eminence is universally given to Surrey, the soil being dry and sandy, but I should speake much of the gardens, fountains, and groves that adorne it.' The grim old yews, whether in lines, or posted sporadically like sentinels; the spinnies of fir, birch, and larch; the long plantations of smooth-boled beeches at Barrows Hedges and 'The Oaks'; the ash, with its characteristic sweep downwards and upwards, which made Grant Allen assert that he could distinguish the tree half a mile from the railway carriage window—these are some of the woodland features of a district now admittedly somewhat denuded of trees. The bird life is abundant. Two or three fields away, in the fall of 1901, we saw some stone curlews; at Hooley farm we have met with bullfinches; whilst tomtits, blue-tits, bottle-tits, and greenfinches are not uncommon. As for lapwings, there are spots which might have been the identical 'lapwing fields' of Richard Jefferies. Saving rabbits, an occasional hare, or a weasel on his beat, we do not see many four-footed wild beasts.

As we pace the uplands, ever there run in the memory Swift's old lines, which will not be dismissed:

> 'Geographers in Afric maps
> With savage pictures fill their gaps;
> And o'er unhabitable downs
> Place elephants for want of towns.'

Well, there was a time when a hypothetical map-maker might have placed 'elephants for want of towns' in this very corner of Surrey. The bones and tusks of these creatures are not wanting in the Mitcham gravels, whither they have been swept by flood water. The train of thought thus established suggests that when tired of flinting, we shall find good scope for geological work proper. One sees the huge chalk pit at Purley—the village of Horne Tooke. The clay-pipes in the chalk can be detected from afar, and we know that the pit is famous for the fossil urchin known as *Micraster cor-testudinarium*. Concealed by the hills on our left is the Hayling pit, where the famous granite boulder was discovered, providing a fact for various theories to be started. This pit contains the base of the snake's heart zone (*M. cor-anguinum*). A good walk of three or four miles, over hill and dale, would take us to the Whyteleafe quarry, which represents another Chalk zone, that containing the elegant *Terebratulina gracilis*. To-day we visit none of these places, but no intelligent flinter can spend hour after hour in the fields without learning valuable lessons on inliers and outcrops; weathering and denudation; sarsens, drift fossils, and many other confused fragments of earlier worlds. Often, when exiled in distant counties, the mind travels to the chalk of Surrey; and after holidays spent amid lovely scenery, we return to the breezy downs and say, 'This is not a bad substitute.'

As we continue our search, a lark begins to sing, as if determined to attract eye and ear skyward. December as it is, the hedge-sparrow will presently try a few notes, and it will not be an unheard-of event for the thrush to begin his 'Knee-deep, knee-deep, knee-deep; cherry-du, cherry-du, cherry-du, cherry; white hat, white hat, white hat; pretty joey, pretty joey, pretty joey.'

Here is the first flake. It is nothing; throw it away. No, stay; it is dirty, we will take it home and wash it before giving the verdict. Here is another, apparently a 'natural'; no, it has a good bulb—it is an artifact. There is, close at heel, however, a flint, of which the strippings are quite natural, being caused by cart-wheels, plough coulters, or the teeth of harrows. Pieces of tabular flint, especially, will assume a prismatic form, and peel so as to resemble tantalisingly the 'middle pieces' which, at times, come off simultaneously with the actual flake. The presence of pot-boilers tells us that we are on the right spot, but, as yet, we see nothing but flakes, flakes, flakes, amid thousands of naturally fractured specimens. Surely, that is an arrowhead lying a yard away, for the glint of the sun on its tiny facets speaks the language. Ah ! it has only a similarity of shape to recommend it ; a neat, triangular knife it proves to be. Next follow various scrapers, end-worked, rounded, irregular, hollow, and, it may be, a double hollow, or dumbbell form.

How lovely is this field speedwell (*Veronica agrestis*) ; one sees it somewhere every week of the year. Here, too, are the petty spurge (*Euphorbia exigua*), some dead-nettles, and actually a belated buttercup. The flint-hunter must, perforce, become somewhat of a botanist. On November 10 of last year we found a solitary corn cockle in bloom in a nook on the East of Epsom Downs. That very next patch to the cabbages where we stand contained almost as many corn cockles as oats last year ; the rich purple of the mass could scarcely be rivalled. On the hedge bank by the cart road, we noticed, in the same month as the waving awns appeared, the squinancy wort (*Asperula cynanchica*), dropwort (*Spiræa filipendula*), the rock-rose of burnished sulphur, and a stray mullein. Over those distant hills is a green lane, with high chalky banks, the haunt of the deadly nightshade, the hounds-tongue, the bee and fly orchis, the twayblade and the white helleborine.

Oh ! here is a delicate little flake ; if you hold it to the light, it is nearly transparent. Its edges are notched by the fabricator, and will require a lens to reveal their skilled work. It would grace any cabinet. There is always a tremor of expectation as to the nature of the next 'turn-up.' We stop to examine a double-bulbed flake—one which has been intractable, and has required two strokes to detach it from the core. Flakes with three, four, and even five bulbs are not unknown. Here, again, is a flake with its bulb missing ; we have seen a knapper at Brandon often detach flake and bulb at one blow. Among all these relics of man's busy ways, one keeps finding some worn Ventriculite, Holaster, Micraster, or even Cyphosoma. Each demands a little attention, and evokes a little speculation as to its travels and vicissitudes since it left its native chalk. It is precisely this speculation, reasonably kept within the boundaries of fact, which lends charm to all these out-door hobbies, and pleases 'that inward eye which is the bliss of solitude.' After visiting the Clent Hills, Hugh Miller wrote: 'I found it exceedingly pleasant to lie this day on the soft short sward, and look down through the half-shut eye, as the clouds sailed slowly athwart the landscape, on an apparition of this departed sea, now in sunshine, now in shadow' Then commences a long soliloquy, touched throughout with great beauty, and rising at times into true eloquence. 'Was it the sound of the distant surf that was in mine ears, or the low moan of the breeze, as it crept through the neighbouring wood? Oh, that hoarse voice of Ocean, never silent since time first began—where has it not been uttered!' And of this Surrey down, we may repeat in Miller's recurring coda, 'But once and again, and yet again, has the roar of Ocean been there.'

But it is lunch time. It is too far to seek the screen of that copse where the alien snowberry (*Symphoricarpus*) has stolen all the spare ground, and now displays its pink, wiry stems, and globular, ivory fruit. We must sit on this scarifier—this 'duckfoot cultivator'—now detached from the engine, which stands idle 200 yards away. The engine is an intrusion. How much pleasanter to see the old-fashioned plough at work, with a company of rooks prospecting the wormy world of the upturned furrow.

We scrape our boots, not for the first time this morning, with steel knife or Neolithic flake. Bread and cheese is our fare, and not bad fare either, better, no doubt, than Mr. Neo. often got, after creeping into his underground house. Nor would he have any cabbages or turnips in his fields, such as those that grow to the right of the scarifier. He had to supplement his small-eared wheat and barley with wild roots which would now be considered contemptible. No meat to-day:

> 'Sutton for good mutton,
> Cheam for juicy beef,
> Croydon for a pretty girl,
> And Mitcham for a thief.'

No, no, Mitcham must have a finer name; good implements have turned up there lately.

The air is cutting, and an icy little breeze rises, but it is better to be here than to sit close-prisoned in town. The view embraces the sheep-walks of Woodmansterne, Chipstead, and Chaldon, and in fancy we hear the pleasant tinkling of the bell carried by the bell-wether. Of old, shepherds used an arrow-head or a small celt as the tongue of a sheep-bell, it was a sure bringer of fertility and good-luck. 'If you saw an arrow-head serving as a bell-clapper would you catch the bearer, and replace the little weapon by an ordinary flint?' Truly, a perplexing question, but collecting ought not to become a mania. Yet the ardent flint-hunter is ever watchful. Did not our comrade, W., find one of his best celts serving as a weight to an old 'wag-at-the-wall' clock, and did he not at once bargain to substitute for it another stone and a goodly coin? Another polished celt was obtained from an ignorant labourer, who was boasting to his fellows in a tavern that he 'had the best whetstone of them all.' This 'whetstone' was an excellent celt, of a material so hard that considerable use had damaged it but little. By the way, Sir Arthur Mitchell relates how, in Scotland, oblong stones are frequently holed for clock weights, this being one proof among many of his assertion that 'there is but a short road from the historic to the prehistoric.'[1]

Numerous are the topics relating to the flint men which have been discussed at these mid-day halts. The camps and camp fires, pot-boilers, summer and winter quarters, the obliteration of the distinction between long-heads and round-heads, the question of extermination or non-extermination, the meaning of particularly rich 'floors' of implements, all these come up for judgment. Of this very spot, our friend the farmer might exclaim with old Kaspar, did he know a flint implement from a foxglove :

> 'I find them in the garden, for
> There's many hereabout,
> And often when I go to plough,
> The ploughshare turns them out.'

After lunch, we cross to the next field, for a change. There we once found an axe of uncommon shape. There, too, is the old fallen trunk on which we have collected mycetozoa, or minute 'slime-fungi,' curious links between the plant and animal kingdoms about which interesting things might be said. But of implements there is to-day little store worth carrying home. We pick up one or two 'brackled' or wavy flakes, which have not split off with the usual single-sweep, conchoidal fracture. There are also flakes from which the bulbs have been removed by the same blows that divided the flakes from the nodules, leaving hollows where the bulbs usually are, but such finds are common.

We return to the old field and work on till the light fails. Several specimens are added to the others already in the bag. Among them is a beautiful core of small size, the dwarfy counterpart of a modern Brandon core which stands on the cabinet at home. The spalls from this core have been stripped off in such a masterly way that one partly suspects the employment of a flint punch for the process. The patina is also so different from that of the surrounding worked flints that it may fairly be concluded that the raw material was strange to the locality, and came hither by barter.

We scrape our boots for the last time, and walk down to the village for a cup of tea. Those who tramp the country, village by village, hamlet by hamlet, field by field, get to know the best tea-rooms. 'Southwards from Surrey's pleasant hills' flew forth Macaulay's bright couriers—the signals of the Armada beacon fires. We must fly Northwards, to town, brightly enough, however, for we have done fairly well. If we cannot have a Cissbury or a Grimes Graves flint factory close to London, we can repair, at any rate, to one of the Stone Man's haunts. And if we do not meet with the best of luck, the day is never blank, for to be in the open air is sufficient, whatever be Nature's garb at the time. The cynic may say that the love of Nature is a pretence, a pose. Good ; but even the cynic will admit the unselfishness of such pleasures. The healthful breezes of the downs, the songs of free birds, the beauty of the wild red rose, the shell from quarry or scarped cliff, these riches of life's 'unlocked treasuries' are for all to win, and the winning of them sweeter because one knows that everyone may share them.

If we want a change of occupation on the next spare day, we may visit one of the Surrey churches, to see the famous frescoes of Chaldon, the font of Weald marble at Merstham, the old library over the vestry at Reigate, the chained 'Book of Homilies' at Leatherhead, the stained glass at Gatton, the brasses at Beddington, the 'priest's door' at Warlingham, or the low-side window at Addington. In such ways does the flinter fill up odd minutes. Or, our hobby may take us to such quaint old villages as Limpsfield, at which place, the Domesday commissioner, either enthusiastically going outside his instructions, or, as Mr. P. E. Dove thinks, anxious to assess accurately all the properties, gravely records two stone quarries and three hawks' nests.

In addition to the pleasure afforded by studying archæology and natural science at the same time, there is knowledge to be got from the accompanying contact with various sides of country life, knowledge of rural matters to be gained in no other way. This lore forms the lighter side of our study, and alone would fill a volume. Thus, in a shallow coombe near one of our haunts, some gipsies make a winter encampment. The coarse clothes of these men, their scanty shelter in tents barely five feet high, their food and style of cooking, separate them generically by a very little gap from Neolithic folk. We have seen a veritable Neolithic wanderer emerge from his hedgerow bivouac, and, as he slunk by, desire to be promoted at once to the possession of bronze! Talking to one of the vagrant lads, we find that in summer the party travel the length and breadth of England. In winter they settle in this sheltered hollow, and do a little work in the fields, picking stones and taking up cabbages and turnips, doubtless often purloining some of these vegetables for the pot. 'Isn't it very cold in the tent?' 'No fear! sometimes a good deal too warm.'

From the gamekeeper we learn something about poachers, hares, and kestrels. A young farmer tells us that 'mint-growing does pay—yes, but in two or three years, when they all start growing it, what then?' A genial innkeeper, of more than ordinary intelligence, whilst admitting that the 'Children's Beer Bill' was a 'good thing for towns,' unconsciously plays on a word and says, 'I call it an insipid Act.' One recalls strange pieces of information obtained from the peasants, expressive words, too, long obsolete in standard English. A ploughman at Buckland 'had been told,' concerning the barrows on Reigate Heath, that they 'used to bring people from Brighton to bury them there.' An old woman, asked if she knew a certain farm at Warlingham, replied, 'Yes, I used to go leasing (gleaning) there fifty or sixty years ago.' And a poor, worn-out road-mender at Oxted contrived to corrupt 'golf-links' into a 'vaulting ground.'

As we pass by the beech copse a wren begins his trill from a bare bough overhanging the icy streamlet. Ter-zer-zer-err-er-r, rapidly lilted forth—an ode to the setting sun. So enlivened, we pass on to the village, and over the tea-table discuss many matters, but, sure enough, all the talk leads up to flints.

CHAPTER XVIII.

*THE CONSTITUTION AND ALTERATIONS OF FLINT, WITH REFERENCE TO THE SUBJECT OF FLINT IMPLEMENTS.**

(1) *Natural History.*

This subject appears to have been dealt with by the method of observation and hypothesis, without sufficient verification by appeals to the laboratory. Probably the difficulty of substituting the time factor has deterred a closer inquiry, but much may be done to surmount this obstacle, and the matter is well worthy of a more extended research, particularly in the direction of establishing criteria as to the antiquity of flint weapons. This is, indeed, our present object, but the inquiry is so closely associated with the original constitution of the raw material that a synopsis of one's opinion on the natural history of flint will not be out of place.

Confining our attention to the flints of the Chalk formation, we find two prominent varieties—(*a*) the stratified nodules, and (*b*) the tabular flint of joints and 'sills.' The former show abundant evidence of having been deposited, as may be imitated in the laboratory, on the floor of the Chalk sea, as gelatinous masses which have afterwards consolidated into the black or dark-coloured flints so common in the quarries of the Upper Chalk. Instances abound forcing this conclusion upon us. Many nodules contain silicified casts and tests of the Cretaceous fauna, and, when these are absent, spicules of sponges and indications of smaller organisms are revealed by the microscope. Sometimes shells are found partly embedded in the surface of the silicious accretion, suggesting that a resting-place was supplied whilst the mass was plastic. Mr. G. E. Dibley's collection at Sydenham contains a large nodule having no fewer than ten echinoids partly embedded, and a still more instructive specimen in the same collection exhibits a complete suite of the calcite plates of a Goniaster enclosed by a nodule of flint which has evidently been subjected to a stress whilst still plastic, for the general arrangement of the creature is entirely distorted, and this without fracture of the plates or of the matrix itself. Another type of deposition shows that silica has replaced the calcium carbonate of the shells.

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The second, or tabular variety of flint, on the other hand, seems, in part at least, to have been deposited after the upraising of the chalk strata, since it appears in joints and cracks where it has been left by the evaporation of its solvent.

(2) *Cortex of Chalk Flints.*

Both nodular and tabular flints show a white cortex, chalky in appearance, which, however, persists after all the adherent chalk has been removed by scrubbing and washing with acid. This cortex, on analysis, proves to be pure silica. The origin of this white coating could not very well be the same as that of the white skin of weathered flakes. We suggest, as a very probable explanation, the removal of the more soluble colloidal silica at the surface of the lumps by the alkaline carbonates of soda and potash which are present in covered chalk to-day (*e.g.*, when capped by the London Clay), though washed out of the upland chalk by long-continued percolation. (See W. W. Fisher, *Analyst*, 1901, pp. 202-208.) The remaining white residue of non-colloidal silica is similar physically and chemically to that of weathered flakes, and will be described under that head. We may add that a black flint, subjected to the action of a solution of sodium carbonate, will whiten in a comparatively short time, the colloidal silica being dissolved out as sodium silicate, from which the silica may be precipitated by the addition of mineral acid. This action can be considerably hastened by boiling.

The weathering of the felspathic and other minerals of igneous rocks must at all times have provided the alkaline carbonates available for these reactions in the Chalk sea. The interior of chalk flints is dark to black, and appears somewhat translucent in thin sections.

A dry sample from the heart of a chalk flint showed a specific gravity of 2·66. A thin section, placed under the microscope, transmitted light faintly, and, under polarised light, showed a weak and uncertain change of colour. It was practically non-porous. The weight of a freshly-broken specimen, immersed in distilled water, became constant in three days, and showed a gain of 0·2 per cent., which might well be attributed to moisture occluded by the surface cavities, especially as a polished black flake, under similar conditions, gained only 0·06 per cent.

A qualitative analysis of a finely powdered sample of the same flint indicated distinct traces of iron and manganese compounds, the former in the ferrous state of oxidation and the latter probably as the dioxide. This latter, the principal mineral of manganese, is densely black, and in all probability is the chief agent in giving the colour to the flint. The fine powder is white, but becomes faint red on strongly heating in contact with air, pointing to the oxidation of the ferrous compound to ferric oxide. A perfectly dry sample of the powder became constant in weight after heating to redness over the foot-blowpipe, and showed a loss of 2·53 per cent., indicating that the flint, in part, at least, was in a hydrated condition.

These results would suggest that homogeneous black flint might be represented empirically by such a formula as $12SiO_2,H_2O$. The question then arises, What part of this silica is hydrated? From other considerations, and from recent work on opals (summarised in the *Journal of the Chemical Society*, vol. lxxx., ii., 1901, p. 109), it seems probable that, although no definite formula has yet been claimed for opal, a working formula might be stated as $10SiO_2 + 2SiO_2,H_2O$ for a homogeneous black flint. This would agree with a mixture of four-fifths or five-sixths of anhydrous silica, with a fifth or sixth of hydrated or colloidal silica. (See Sir J. Evans, 'Ancient Stone Implements,' p. 497, and below.)

But it is perhaps futile to attempt to express, by formulæ, the constitution of flint, for the relative amounts of the two ingredients vary considerably from the normal specimen mentioned above. Many samples show a larger proportion of the stony-looking anhydrous silica, and especially is this observable in those cases where organic structure is exhibited. It appears likely that the substitution of silica for calcite or aragonite is a molecular one, so that the silicified test of an echinoid, for example, is formed of anhydrous silica, white or nearly so, while the cavity is filled with the ordinary dark flint.

(3) *Alteration of Flint: Flakes with White Secondary Cortex.*

A white Cissbury flake, which had weathered throughout to uniform white silica, showed a specific gravity of 2·43. On saturation in boiling water, a portion of 4·57 grammes, dry weight, gained 0·61 grammes, which, assuming 2·5 as the specific gravity of the removed part, would indicate a loss of 0·61 × 2·5 or 1·52 grammes, or one-fourth of the original body. This flake was so loose in texture that it was easily crushed in a mortar. A thin section of this cortex and the fine powder were quite opaque by transmitted light, showing no trace whatever of crystalline structure, and by reflected light the material was white and somewhat granular in texture. A dry sample of the powder, heated to redness for a considerable time, lost no weight whatever, its composition being thus indicated as pure anhydrous silica. No trace of lime or other compounds appeared in the chemical analysis.

The interior of white flakes grades from the black flint described above to the intermediate colourless and translucent state (still showing presence of colloidal silica), and from this to the final, homogeneous condition in which anhydrous silica alone is present.

Whitening.

From close observation and careful experiment, we have come to the conclusion that this is due mainly to the dissolving out of the more soluble colloidal silica by rain-water charged with carbonic acid. Three pieces of black flint, freshly chipped from the same nodule, were exposed respectively, A, to the action of water with free carbonic acid gas saturated at ordinary pressure ; B, to a moderately strong solution of ammonia ; C, to a constant change of London water in a large laboratory cistern. In four months, A was sparely spotted with the familiar white marks indicating the beginning of the secondary cortex ; B and C showed no visible signs of alteration. In another period of four months, A showed an extension of the whitening process, but B was still apparently unaltered. The removal of the colloidal silica is accompanied by the abstraction of the colouring particles, which are apparently included in the glassy matrix.

A solution of an alkaline carbonate would produce the same result, but this agent is practically absent from the surface of the fields and downlands where our observations have principally been made.

The shaped flints so widely used for building boundary walls and churches in the South-East of England, supply interesting evidence in confirmation. In a comparatively few years the new surfaces become partially whitened as in the case of flakes, even at the summits of the highest steeples. Consequently, this kind of weathering of flint, as a sole or independent criterion of antiquity, must be abandoned. Indeed, in the same ploughed field where cultivation has brought to the surface flakes which have lain beneath the soil cap undisturbed for centuries, we may find flakes and implements, obviously of the same age, some quite black and polished, whilst others are quite white, with all the gradations of change between these two extremes. A foot or two of soil, especially if clayey, protects the covered flint from the solvent action of carbonic acid, and as the rain-water descends, it tends to lose its free carbonic acid by agitation and by combination with chalk to form the bicarbonate of lime. But on the bare downland, not yet invaded by the plough, all the flints are white, and generally the altering process has penetrated far into the body of the flint. Examples are not wanting which exhibit a weathered white upper surface and a dark under surface in the same flint. Such cases occur where the flint was partly embedded in clay.

(4) *Polish.*

This I consider to be wholly a question of friction. The gentle movements of the soil cap, continued through ages, provide, under favourable circumstances, a factor quite competent to produce the finest polish. Hence polish is a better guide to age than is whitening ; its absence, however, does not necessarily lead to the inference that an implement is of recent fabrication. Where conditions occur that tend to protect the flints from chafing, little or no polish is found.

The section of stalagmite from the floor of the cavern at Les Eyzies, to be seen at Jermyn Street Museum, is very instructive on this point. The flakes sealed up and protected from attrition and from the action of rain-water are neither polished nor white, indeed, their surfaces are as if new. But in the cave-earths which are subject to flood waters and hence to movement, we find that the flakes may be white and polished, and generally are both. I think this later illustration should dispose of the favourite conjecture referring the ' bleaching of flints ' to the action of sunlight.

Professor T. M'Kenny Hughes attempts to differentiate between the glazed surface and the underlying portion of a white cortex. Speaking of such an example, where the ' smooth patinated surface ' has suffered abrasion so that the porous under layer shows in patches, he states it as ' probable that the patina is not merely the surface condition of the porous white silica, seeing that it occurs on flints which have no layer of the porous white silica beneath them ' (*Arch. Journal*, 1897, Vol. liv., pp. 368-370). But, on submitting a dull white Cissbury flake to two or three hours' rubbing with precipitated silica, a glaze was produced indistinguishable from that caused by natural forces. If the white ' skin ' is very thin, and bears a polish, the white, underlying, porous layer would not be conspicuous, and we are inclined to think that the dull patches exposed by the loss of the polished surface might, under favourable conditions, be repolished. This might not be the case in those instances mentioned by Sir John Evans ('Ancient Stone Implements,' p. 497) where the coherence of the residual anhydrous silica has been so lessened (Is frost a factor in this process ?) that the flints 'can be scratched with a knife.'

(5) *Colour.*

The yellow, brown, and red stains of Palæolithic implements and of the gravels with which they are associated, are due principally to the ferruginous minerals, limonite ($2Fe_2O_3,3H_2O$) and chalybite ($FeCO_3$), both of which are precipitated from solution in natural waters, saturating flints which have already become somewhat porous, at the surface at least, by loss of hydrated silica. It is not improbable that, in some cases, the iron compound which is held by the colloidal part of the flint is itself the source of the colour, provided that the water acting upon it has the necessary oxidising capacity.

The jet-black or chocolate-black patina (stain) of flint which has been lying in peaty and other beds of vegetable origin is due to the formation of organic salts of iron, *e.g.*, tannate or gallate of iron. A brownish flint of the character mentioned above, immersed in a solution of tannic acid, commenced to stain an inky black in a few weeks.

Other colours are of local and accidental origin. A pinkish tinge may be produced by the formation of salts of manganese, as $MnCO_3$, from the dioxide associated with the fluids, or disseminated through the chalk soils, and liberated by the disintegration of the chalk. Then there is the staining of iron oxide, due to the oxidation of streaks left by horseshoes and agricultural appliances. The bluish tint, often met with, seems to represent a stage of the weathering to white, at which the 'skin' is so extremely thin as to transmit, in a modified way, the colour of the flint below.

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